

Iraq Reports 13 Bomb Attacks On Iran in a 'Day of Revenge'

Compiled by Our Staff From Dispatches MANAMA, Bahrain — Iraq said its planes bombed 13 oil, industrial and other targets inside Iran on Wednesday in a "day of revenge" for Iranian attacks on Kuwait.

The communiqué said the raids were launched in a "day of revenge to underscore the bonds of blood, religion, history and destiny between Iraq and Kuwait and as a salute from Iraq."

Iran said that 75 civilians had been killed or wounded in the attacks and that it had shot down two Iraqi jet fighters. It promised to retaliate swiftly for the raids.



Corazon C. Aquino walking to her palace guest house in Manila after her cabinet resigned.

Cabinet Resigns To Give Aquino 'A Free Hand'

By Keith B. Richburg Washington Post Service MANILA — President Corazon C. Aquino's entire 28-member cabinet submitted resignations Wednesday to give Mrs. Aquino "a free hand" to reshape her embattled administration, after an aborted coup that has underscored serious divisions in the government.

The second major government change came when many of her original cabinet members resigned in the spring to run for seats in the new National Assembly.

U.S. Considers Request From Chad for Missiles

By David B. Ottaway Washington Post Service WASHINGTON — The Reagan administration is considering a Chadian government request for U.S.-made Stinger anti-aircraft missiles following what appears to have been the worst Libyan military defeat by Chad forces this year, according to U.S. officials.

Libya. They indicated that additional U.S. emergency aid might be forthcoming, including Stingers, if the situation warrants it.

In Washington, the United States criticized the Iraqi attacks and appealed to both sides to stop fighting.

Danish Parliament in a Deadlock Despite Election Setback, Schuster to Form Government

By Howell Raines New York Times Service COPENHAGEN — Prime Minister Poul Schluter, after a surprising setback in general elections, went through the formality of resigning Wednesday, but then immediately went to work to form a new coalition government.

That the parliamentary deadlock was caused in part by fringe forces of polarization and extremism not in keeping with Denmark's tradition of consensus.

When I sat down, there was a blank piece of paper in front of me," said the defense minister, Rafael M. Nieto. "My neighbor told me we were going to tender our resignations."

Klosk

U.S. Aide Sees Soviet Star Wars

WASHINGTON (AFP) — A key U.S. arms control adviser, Edward L. Rowley, accused the Soviet Union on Wednesday of developing technology to attack ballistic missiles in space while holding up talks on long-range nuclear weapons with demands that Washington abandon its space-based Strategic Defense Initiative, or "Star Wars."

The Pentagon spokesman, Robert B. Sims, noted Tuesday that there was speculation that the Stinger was under consideration for Chad, but said it would be "inappropriate" for him to discuss any "specific hardware."

The sources also said that a Hawk surface-to-air missile used Sunday by French forces to shoot down a Libyan Tupolev-22 bomber over Nijamena was not provided to Chad by the United States but had been sold earlier to France.



HART AIMS TO 'HAVE IMPACT' — Gary Hart in his first television interview since withdrawing as a Democratic presidential candidate in May. He told ABC's Ted Koppel that he had "no plans" to re-enter the '88 race but would "try to have an impact." Page 2.

Portugal Might Consider Scrapping U.S. Base Pact

By Paul Delaney New York Times Service LISBON — Angry over the level of U.S. aid the country is receiving, Prime Minister Anibal Cavaco Silva has said he would consider scrapping a longstanding treaty that allows the United States to lease an air base in the Portuguese-occupied Azores Islands.

Below the annual \$205 million that Portugal had been receiving because of congressional cuts in foreign aid. In addition, the official said, Mr. Cavaco Silva's concern is that a trade bill pending in Congress, aimed at Japan, would also affect imports of Portugal's textiles and steel.

French Company Investigated in Sale Of Military Technology to the Soviets

By Jacques Neher Special to the Herald Tribune PARIS — An international body that monitors sales of sensitive technology to East bloc countries has begun an investigation into a French company's sale of sophisticated propeller-milling machines to a Soviet shipyard several years before similar sales were made by a subsidiary of Japan's Toshiba Corp.

1983 sold the Soviet Union computerized milling machines that were capable of producing quieter submarine propellers. The disclosures generated outrage in the U.S. Congress and have led to calls for a ban on all Toshiba imports by the United States.

He said the Paris-based COCOM wants to know why the Industry Ministry and the Trade Ministry granted export licenses that allowed Ratier-Forest to ship several five-axis milling machines to the Soviet Union, even though such sales were likely to have been prohibited by the organization.

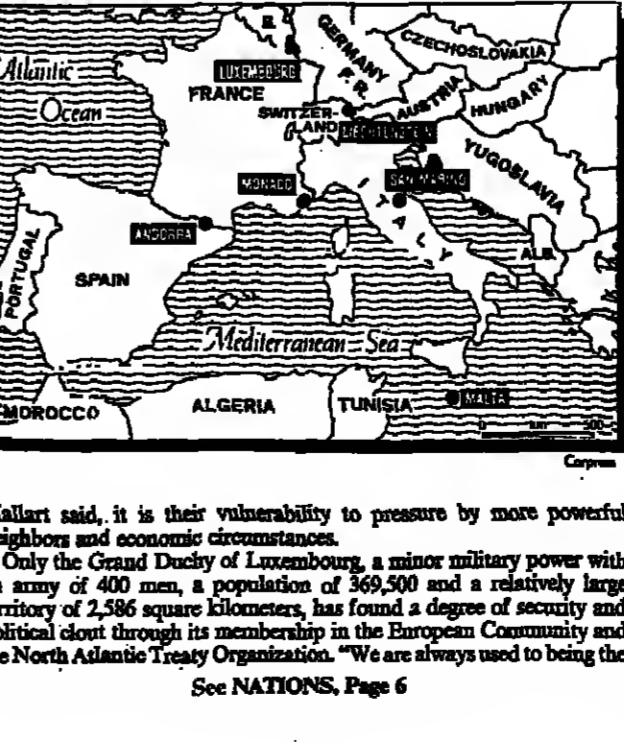
Small Talk: 6 Dots in Europe Try to Put Things in Perspective

By Barry James International Herald Tribune ANDORRA LA VELLA, Andorra — Six countries that loom modestly on the map of Europe are meeting in Andorra this week to examine the proposition that small really is beautiful.

Once much of Europe was like them — city-states, fiefdoms, principalities and dukedoms. Four that survived — Andorra, Liechtenstein, Monaco and San Marino — are historical accidents, harmless anachronisms in a world of big-power politics.

think of his policies, he said. That can be refreshing, he said, but troublesome, too, if he has just been obliged to do something unpopular. "People really are happier in a small country," said Luis Mallart, an adviser to Andorra's council of education and culture, which organized the meeting this week.

Joseph Pinat Solans, the head of Andorra's government, managed to meet a sizable proportion of the population Tuesday when he attended mass at the shrine of the Virgin of Meritxell to mark the national holiday, which celebrates the country's existence as a semi-independent entity since 1278.



The current treaty was renewed in 1982 after a year of negotiations. Secretary of State George P. Shultz signed the seven-year accord which provided \$1.52 billion in aid over the course of the treaty — money that Mr. Cavaco Silva said has been declining.

Justice Marshall, 79, confirmed Tuesday that he made the remarks in an interview with the columnist Carl Rowan. But he did not elaborate on his criticism of Mr. Reagan.





One of a series of messages from leading companies of the world appearing during the IHT's anniversary year.

THE NEW YORK HERALD

Captain Amundsen Will Set Out for Arctic Islands Made Famous by Herald

Norwegian Explorer's Party Will Drift, Locked in Ice, for Three Years.



CAPTAIN ROALD AMUNDSEN

Captain Roald Amundsen, the famous Norwegian explorer, is in Paris and was interviewed by a Herald correspondent... The expedition will be the first to go to the South Pole...

On the north coast of the Delta, Amundsen said that he will drift with all his men, for and the party will be locked in ice...

Women to Blame For Tobacco Card in England?

London, Wednesday — According to the "Daily Mail Gazette," the British Government will probably issue tobacco cards as an early step...

Au Jour le Jour

Paris, Wednesday — The French Government will probably issue tobacco cards as an early step...

Marie Corelli Fined \$71 for Hoarding Sugar... Several Hundred Dealers and Key Sellers Yield to Publishers — Others to Follow.



MARIE CORELLI

NEWSPAPER STRIKE IN NEW YORK CITY DECLARED FAILURE

Several Hundred Dealers and Key Sellers Yield to Publishers — Others to Follow. Several hundred newspapers and newsboys throughout the city tonight declared a failure...



TWO MODELS FROM MARION CHANEL

The show closes on Thursday night of the new spring styles from the House of Chanel... Several hundred newspapers and newsboys throughout the city tonight declared a failure...

Decorate with Marmite advertisement

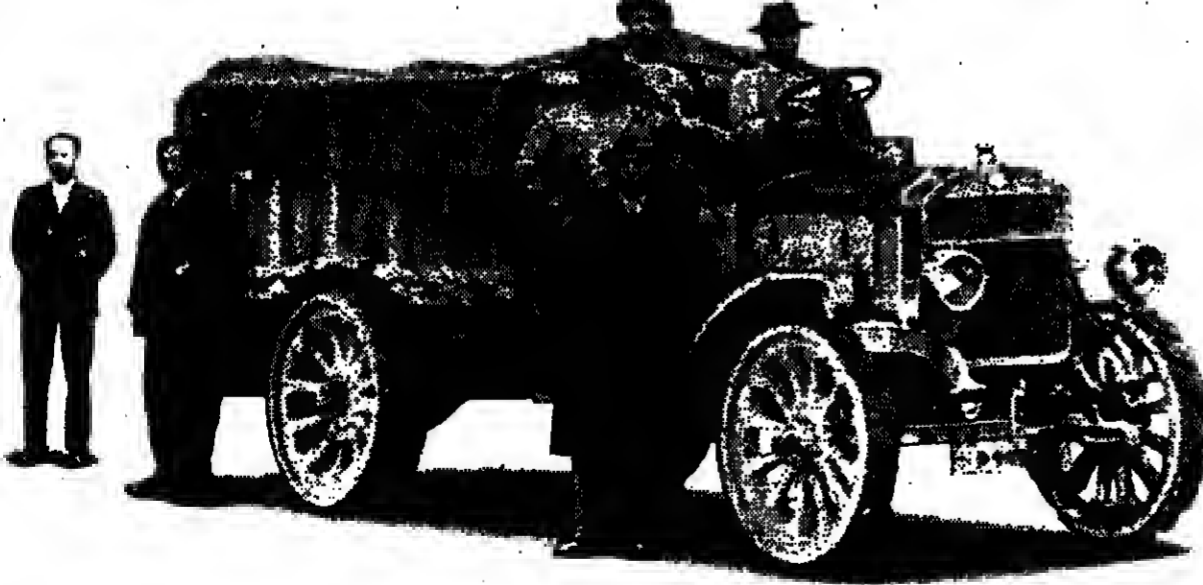
Prunier advertisement

1918 The New York Herald simulated page is compiled from the archives of The International Herald Tribune.

Two Pioneers of Strength and Durability Begin Long Journeys. And that Pioneering Spirit Lives On.

For Captain Roald Amundsen, the first man to reach the South Pole, this journey was to continue in stages for the next seven years, covering thousands of kilometers of the frozen Arctic Circle.

For the 1918 Mitsubishi T-1, it was the pioneering step that began a heritage in quality truck production for the next seventy odd years.



As Mitsubishi Motors' first truck, the T-1 was the product of extensive research and dedicated engineering which reflected the determination of its engineers to produce a dependable commercial vehicle of lasting serviceability.



Partial view of the left page of the newspaper, including 'World Briefs' and 'Labor Picture Imp...

INTERNATIONAL TRIBUNE

Status Quo for Germans

Erich Honecker is visiting West Germany, the first East German leader to do so. Now the visit, while historic, seems perfectly natural. It demonstrates that after decades of political conflict the two Germanys have come to accept the status quo...

Bad Times for Gadhafi

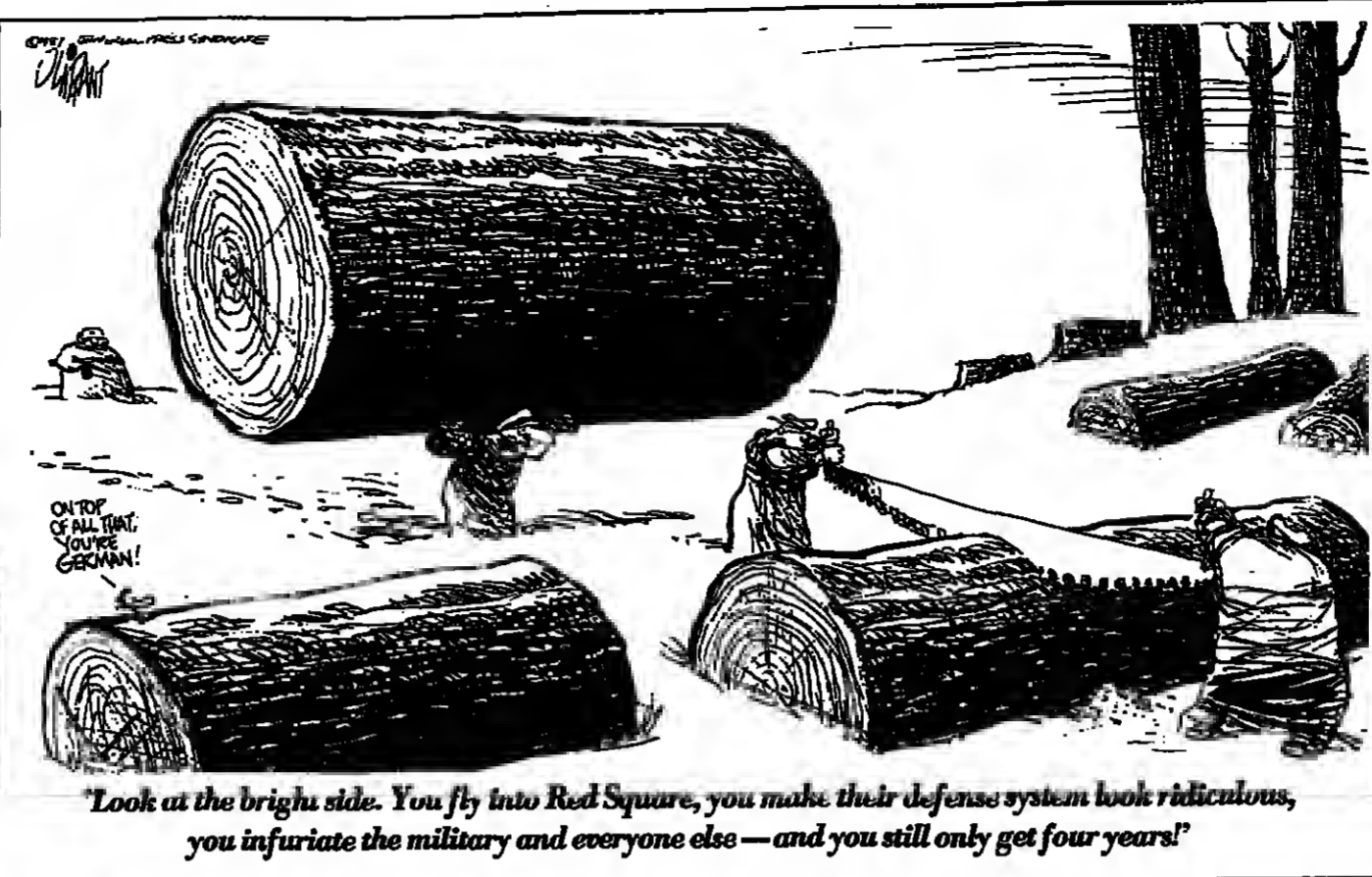
It has been, fortunately, a bad summer for Moammar Gadhafi. Chad, a country which the Libyan leader has tormented for years, spent August reducing his army and prestige to tatters...

Greenspan Tightens Up

Alan Greenspan, the new chairman of the Federal Reserve Board, took a necessary first step on Friday when the board raised interest rates by half a percentage point...

Overdue Tennis Lesson

For years John McEnroe screamed and cursed his way through tennis matches, and the craven tennis establishment gave in. Last weekend, in the person of a 22-year-old Australian umpire named Richard Ings, the sport finally grew some self-respect and struck back...



An International Trusteeship Might Rescue Haiti

NEW YORK — What a collection of fakes we Americans are! We endlessly proclaim our devotion to democracy and human rights. We endlessly rebuke the rest of the world for failing to reach the high standards of liberty and prosperity that we unflinchingly achieve ourselves (or do we?)...

Put the Khmer Rouge in the Dock for Genocide

LONDON — Every year the United States and most of the rest of the world vote at the United Nations to continue recognizing the Khmer Rouge regime led by Pol Pot as Cambodia's legal government. That overthrown regime was widely considered one of the most murderous groups to cross the 20th century's political stage...

Greenspan's Debut Hasn't Impressed the Worriers

WASHINGTON — The Alan Greenspan era at the Federal Reserve Board has been ushered in with the first boost in interest rates since 1984. Apparently it was designed to tell the world that the Fed is worried about the slump in the dollar and a perceived threat of inflation...

Why Israelis Are Losing In America

WASHINGTON — Throughout the United States government, the case of Israel has suffered a steep decline in the last year. At the Defense Department, a publication prevails at the shooting down of Israel's bid for technological independence in the international aircraft market...

Spreading the Blame in Southern Africa

WASHINGTON — I have never seen Richard Longshore, but I like the idea of the California assemblyman who has introduced a bill to force the state to sue the federal government for the physical effects of its policy on public health...

Moscow's Decision Opening the Door

WASHINGTON — Although possibly having no ammunition for the charge that it has treated the Soviet Union as a superpower, the Soviet Union has taken a step toward opening a new chapter in its relations with the West...

1912: Bulgarians Killed

SOFIA — The killing of two Bulgarian corporals, who were ambushed by Turkish troops near the frontier post of Kapatepe, is regarded here as further evidence of the desire of the Young Turks to endeavor to force a conflict with Bulgaria...

1937: A Bank Gives Up

SCENERY HILL, Pa. — After 37 years of operation the First National Bank of Seneca Hill today Sept. 9 paid off its depositors and stockholders in full and closed its doors...

INTERNATIONAL HERALD TRIBUNE JOHN HAY WHITNEY, Chairman 1958-1982 KATHARINE GRAHAM, WILLIAM S. FALEY, ARTHUR OCHS SULZBERGER Co-Chairmen LEE W. HUBNER, Publisher JOHN VINCIGUERA, Executive Editor... WALTER WELLS, News Editor... SAMUEL APT, KATHERINE KNORR and CHARLES MITCHELLMORE, Deputy Editors... CARL GEWELTZ, Associate Editor... ROBERT J. DONAHUE, Editor of the Editorial Pages...

Foes of Smok

WASHINGTON — I have never seen Richard Longshore, but I like the idea of the California assemblyman who has introduced a bill to force the state to sue the federal government for the physical effects of its policy on public health...

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OPINION

Foes of Smoking on Airliners Are Right

By George F. Will

WASHINGTON — I have never seen Richard Longshore, but I like to imagine that the California assemblyman is ruggedly built for the physical defense of liberty and freedom from the rhetorical defense of it. During the debate on a bill to ban smoking on public transportation in California, the chain-smoking legislator said: "I think this is really a civil rights issue. First you say, 'Smokers get to the back of the bus.' And now you're telling smokers to get off the bus."

Titanic: Back to the Spot Where the 1,500 Froze

By William F. Buckley Jr.

A BOARD L'ABELLE SUPPORTER — The tender vessel is bound for the spot where the Titanic sank on April 15, 1912. It carries aboard, from the little French island of St. Pierre just south of Newfoundland, half a dozen of the entrepreneurs who make up the U.S. end of the expedition devoted to lifting from the floor of the ocean, 3,800 meters (almost two and a half miles), artifacts and memorabilia from the Titanic.

MEANWHILE

additional tension. Although all the tradition of salvage adamantly affirms that the operation could proceed with the kind of self-assurance one associates with the salvage operations that in years gone by have found gold and diamonds and frankincense and myrrh off Bermuda, Florida, Peru and indeed everywhere in the world where storms or pirates have sunk boats loaded down with treasure — despite all this, there is something different about the Titanic.



LETTERS TO THE EDITOR

Spreading the Blame in Southern Africa, and Elsewhere

In two front-page articles on the economic problems of Mozambique and Angola (Sept. 2), the country of South Africa was mentioned only once. The report "Rebellion Leaves Mozambique a Stricken Country" fails to mention South Africa at all in discussing the war that has destroyed Mozambique's economy. It calls a "civil war" what is in fact a continual attack on Mozambique by the government of South Africa using mercenaries. Without the support of South Africa, the Mozambique National Resistance, Renamo, would not exist.

The Reagan administration has recently declared that there is no connection between disarmament and development. As your Sept. 2 stories on Angola and Mozambique make clear, the deaths, injuries and destruction of habitat and lives...

Leave the Titanic in Peace

If the Titanic were an ancient wreck, like a Greek trireme at the bottom of the Aegean, there would be no objection to raising parts or all of it. If it were recently sunk, like the Herald of Free Enterprise, which went down in shallow water in March, there would be no discussion of the rights and wrongs of a salvage operation. Provided there were no technical difficulties, everyone would want the ship raised and my bodies of victims delivered to next of kin for a decent burial.

Life-and-Death Numbers

Lewis Fry Richardson's work on arms races and wars deserves more than the casual mention by Barry James in "Improving Forecasting by the Numbers" (July 30). Mr. Richardson's studies constitute the foundation of a small but growing scientific literature on arms race dynamics and conflict.

The Soviet System Endures

Nathalie Novik (Letters, Aug. 25) is unduly pleased with glasnost. She does not appreciate that insofar as current changes in the Soviet Union verge on liberalization, they are insignificant, and insofar as they are significant they aim at consolidating Soviet totalitarianism.

GENERAL NEWS

Moscow's Decision on Radar Site: Opening the Door for Political Gains

By William J. Broad New York Times Service MOSCOW — Although possibly providing new ammunition for those who charge it with treaty violations, the Soviet Union has taken the surprising step of opening a disputed top-secret radar installation to Western inspection to show its willingness for an East-West accord at a critical time in arms control.

Yark, also pressed Soviet officials in Moscow about the radar. Mr. Downey and the Natural Resources Defense Council eventually joined forces in a week-long trip to the Soviet Union to pursue a variety of arms-control issues; the visit culminated in the Krasnoyarsk tour.

On one technical level, the Russians had little to lose since top-secret photos from American spy satellites had already raised many questions about the radar's purpose. Spotted from space more than four years ago, the radar is clearly pointed northeast — a direction well suited for tracking enemy warheads and less than optimal for tracking satellites, the rationale offered by the Soviet Union.

The Kremlin, in making its decision to open its Krasnoyarsk site to a congressional delegation over the weekend, seems to have calculated that the gains would outweigh any political or military losses.

NEWS ANALYSIS satellites had already raised many questions about the radar's purpose. Spotted from space more than four years ago, the radar is clearly pointed northeast — a direction well suited for tracking enemy warheads and less than optimal for tracking satellites, the rationale offered by the Soviet Union.

What the recent inspection did was to lessen the West's worst fears about the site. The Reagan administration has charged that the radar is intended to track enemy warheads, at the very least for early warning of nuclear attack, and possibly for help in waging defensive wars meant to destroy enemy missiles and warheads, an ABM application known as battle management.

U.S. Delegation Not Sure if Radar Breaks ABM Pact

WASHINGTON — Three congressmen and several experts who visited the Soviet radar site at Krasnoyarsk last week said Tuesday that they were unable to determine whether the installation violated the 1972 anti-ballistic missile treaty.

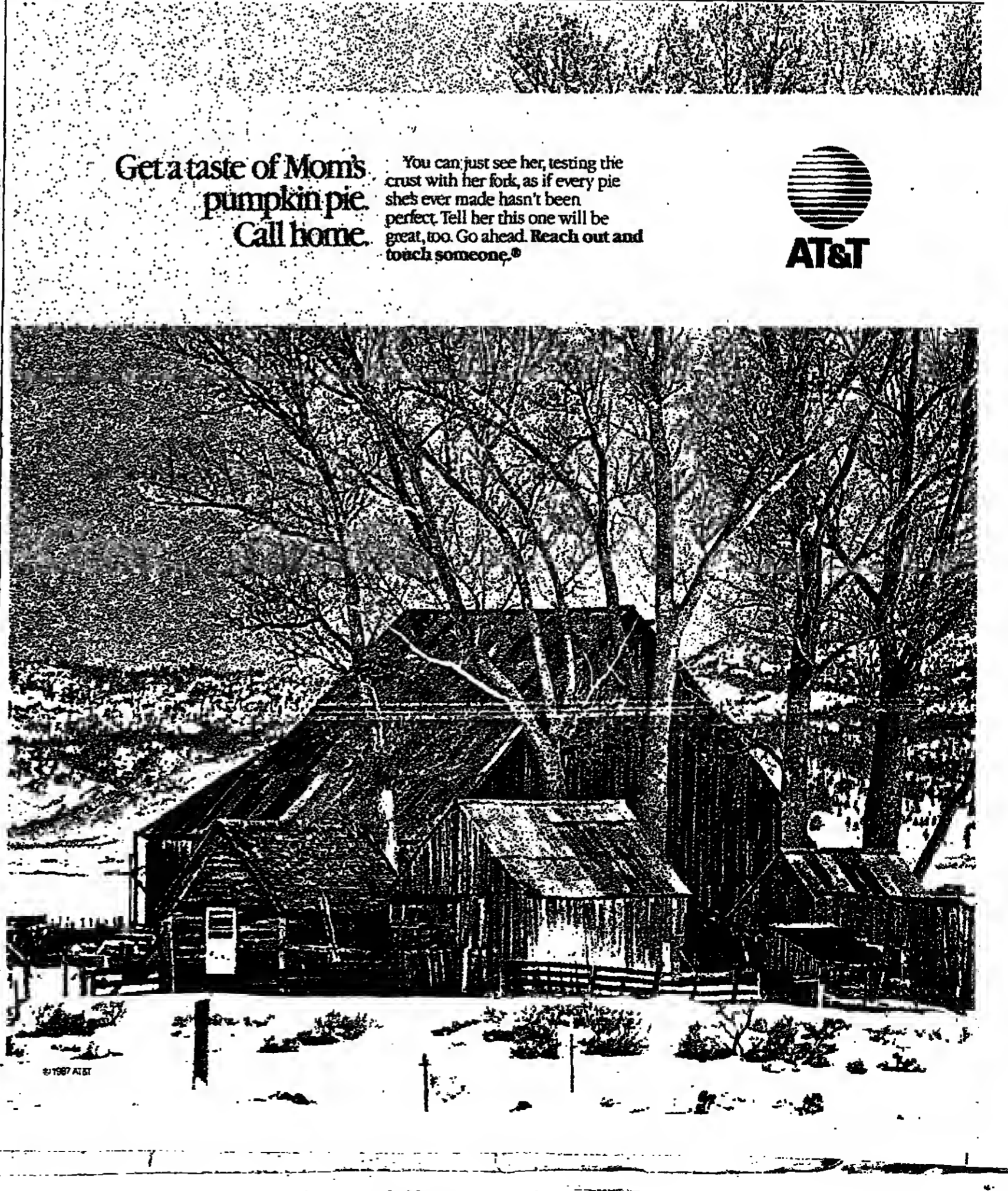
But the State Department repeated the Reagan administration's contention that the radar does in fact violate the ABM treaty. The returning delegation praised Moscow for opening the site to inspection and said the two years or so before the radar becomes operational provided the United States with an opportunity to negotiate a resolution to the dispute.

One of Moscow's potential losses in the visit involved the breach of military secrecy. A major goal of hiding what seem like mundane facts about military hardware is to deny potential foes firm knowledge of the strengths and weaknesses of a nation's war machine.

Although the half-built radar clearly raises questions about Moscow's adherence to the letter of the ABM treaty, close inspection suggested the site is more benign than menacing — that it is potentially a mediocre early-warning radar rather than a hardened bunker for coordinating anti-missile war.

Even so, having seized the initiative by opening the site to foreigners, the Soviet Union now stands ready to score political points. Most importantly, increased candor over Krasnoyarsk seems to bespeak a desire to stop the erosion of the ABM treaty, ostensibly a long-term Soviet goal based on its opposition to President Ronald Reagan's "Star Wars" anti-missile program.

More than a year ago, the Natural Resources Defense Council, a private group based in New York, raised the issue in meetings with Soviet officials. The group runs a program to monitor the Soviet new test site in Soviet Kazakhstan and has good access to Soviet officials.



Get a taste of Mom's pumpkin pie. Call home.

You can just see her, testing the crust with her fork, as if every pie she's ever made hasn't been perfect. Tell her this one will be great, too. Go ahead. Reach out and touch someone.®



In April, Representative Thomas J. Downey, Democrat of New York...

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Sikh Priests Say Militants Have Unified For Struggle

Compiled by Our Staff From Dispatches
AMRITSAR, India — Four of the five chief priests of the Sikh religion on Wednesday declared that militant groups fighting for a separate Sikh nation in Punjab State had unified, and the priests urged followers to support the "war of liberation."

The priests said that 16 militant groups in India and abroad had achieved "complete unity" and would provide political leadership to Sikhs in place of the "discarded Akali leadership."

The statement was the strongest yet by Sikh religious authorities. It occurred as the separatist campaign is becoming increasingly violent after the government of Prime Minister Rajiv Gandhi took over the administration of the northern state on May 11. Mr. Gandhi dismissed the moderate Sikh government of the Akali Dal, the traditional Sikh political party.

The national government reacted sharply to the priests' statement and vowed to defeat Sikh terrorism. The priests' statement "has come as an open and direct challenge to the unity and integrity of the Indian nation," Federal Home Minister Buta Singh said in New Delhi.

The announcement was made by four of the five members of the Akal Takht, the religion's highest temporal body. It is responsible for preserving the faith and arbitrating religious disputes.

The announcement from the Golden Temple, seat of the Sikh religion, called on Sikhs worldwide to give "tan man dhian, or body, soul and wealth, to the militants' declaration for liberation." It said the Indian government was oppressing Sikhs throughout the country. The militants claim Sikhs suffer discrimination from India's Hindus, who make up more than 80 percent of the country's more than 750 million people.

Sikhs, whose religion was founded as an alternative to warring Hinduism and Islam, make up only 2 percent of India's population. But they are a majority in the Punjab, a rich farming state.

Jaswant Singh of the Damdama Sahib, a major Sikh temple, read Wednesday's announcement at a news conference.

Three other leading Sikh priests, Purn Singh, Kashmir Singh and Sawinder Singh, said they supported the statement. Singh, which means lion in Punjabi, is part of every Sikh man's name.

A formal announcement about the unification of the militants will be made by the groups soon, the priests said.

The 16 groups are known to include the Khalistan Commando Force, Khalistan Liberation Force, Babbar Khalsa and Bhindranwale Tiger Force.

The priests also criticized professor Darshan Singh, the head of the Akal Takht and fifth member of the body, for fleeing the Golden Temple on Aug. 8 after he received death threats from militants in the shrine.

On Aug. 17 the four priests had called on the militants to provide leadership for the 16-million-strong Sikh community in place of the Akali Dal.

The Akali Dal was elected to power in Punjab in 1985, but dismissed in May by New Delhi for allegedly failing to tackle the campaign for a homeland in Punjab, in which nearly 1,300 people have died since last year.

The Indian Army stormed the Golden Temple on June 6, 1984, and more than 1,000 people were killed, most of them Sikhs. The prime minister at that time, Indira Gandhi, ordered the raid to drive out Sikh militants using the temple as a refuge for attacking Hindus and rival Sikhs.

On Oct. 31, 1984, Mrs. Gandhi was assassinated in New Delhi, and police said the killers were two of her Sikh bodyguards who were avenging the Golden Temple raid. One Sikh guard was shot to death by other guards. Three other Sikhs were convicted in connection with her killing and have been sentenced to be executed.

(AP, AFP, UPI)



EXTRADITED FANS IN BRUSSELS — Police vans carrying 25 Liverpool football fans arriving Wednesday at the Palace of Justice in Brussels for a hearing before a magistrate on charges of manslaughter in connection with the Heysel Stadium riot, in which 39 persons were killed in 1985. A 26th fan who was scheduled to be extradited was still Britain in connection with another case, police said. The trial is expected late this year or early next.

EXPORT: French Firm Investigated in Sale of Military Technology to Soviet

(Continued from Page 1) A former executive of Ratier-Forest, who was involved in the sale, said he doubted the company brooks any risks in selling the machines.

"I'm not sure these machines were ever in contradiction with COCOM," said Robert Vitrat, who at the time was sales director of Ratier-Forest. He said the company delivered "at most" two of the five-axis machines to the Soviet Union in 1976-77.

He said the export license applications were approved by the industry and trade ministries, as well as France's COCOM delegation. "As far as I remember, we had no problem at all getting approval for that kind of machine," he said.

He added that the company was used at the shipyards, but that it did not know they would be used for military applications. The Soviets, he said, did not permit the company to install the machines.

One U.S. naval analyst, who asked not to be named, said: "I suspect that if they had a program to make a new generation of submarine propellers, the French equipment was a considerable help."

Mr. Vitrat acknowledged the machines may have helped "improve the production and productivity" of the submarine propellers, but he emphasized that the Soviets had already designed and produced the parts on their own.

"No machine has ever invented a new propeller profile, and that's a very important point," he said. U.S. officials say the machines' final destination should have kept the French authorities from approving such a sale.

"The disturbing thing here is that if anyone said 'Baltic Shipyard' to us, we would have said 'No, never,'" said Stephen D. Bryen, who heads the Pentagon's export control office.

DANES: Schluter to Stay On Despite Election Setback

(Continued from Page 1) Niels Helvig Petersen, the Radical Left leader, to abandon Mr. Schluter and add his 11 votes to the 85 votes held by the coalition led by the Social Democrats and the Socialist People's Party.

This would bring in a new Socialist government and amount to a dramatic repudiation of Mr. Schluter's effort, since 1982, to move Denmark toward a market economy and restrain spending on maintenance of the welfare state.

Given the high political stakes, it is hard to think of another country where such bargaining among three leaders would take place at a good-humored public luncheon.

On Wednesday at the Hotel Royal in Copenhagen, the audience laughed and the three men exchanged witticisms as Mr. Jorgensen asked Mr. Petersen to help him do in Mr. Schluter, Mr. Petersen responded cordially, but refused.

Mr. Schluter said that the three gainers in the election all had "extremist views."

MARSHALL: Supreme Court Justice Criticizes Reagan on Civil Rights

(Continued from Page 1) Justice Marshall spoke bitterly of the treatment of blacks throughout American history, including the present. In a speech in May he denounced the "perpetuation of slavery" and other actions by the framers of the Constitution.

However, in the interview with Mr. Rowan, he said that with the addition of the post-Civil War amendments extending rights to blacks, "You'll never find a better Constitution than this one."

"The biggest thing we brag about in this country on the ethical side is that it's the great melting pot," Justice Marshall said. "As I sit and look at it now at this late date, I have come in the definite conclusion that if the United States is indeed the great melting pot, the Negro either didn't get in the pot or he didn't get melted down."

Asked by Mr. Rowan to rate some of the presidents and their impact on racial justice in his lifetime, Justice Marshall said: "I don't think Roosevelt did much for the Negro. But I think Truman is going to come out on top. Eisenhower I don't think did anything, except to try to under-

mine the school decision — which he did. Kennedy was held back by the attorney general, his brother. His brother said don't do anything for the Negroes because you won't get re-elected — wait until you're re-elected and then do it. And then he got killed.

"But Johnson, his plans were unbelievable, the things he was going to do. But he was too far off for Negroes and civil rights, he wasn't thrown out because of Vietnam, they just used that as an excuse to get rid of him."

In response to a question, he said he thought Johnson was the greatest president in terms of civil rights. Of Jimmy Carter, he said: "I think his heart was in the right place. But that's the best I can do with him."

There followed this exchange: Mr. Rowan: "What about Ronald Reagan?" Justice Marshall: "The bottom." Mr. Rowan: "The bottom?" Justice Marshall: "Honestly, I think he's down with Hoover and that group. Wilson. When we really didn't have a chance."

Mr. Rowan: "Yet he's been one of the most popular presidents the country ever had in the polls."

Dole Says Call for 'a Little' Invasion Of Nicaragua Was Not Just a Quip

WASHINGTON — The Senate Republican leader, Bob Dole, said Wednesday that he was not simply making "a quip" when he was quoted as saying that "a little three-day invasion" of Nicaragua would be welcomed by the people of Central America.

The Kansas Republican said that "I was just expressing an opinion" that President Daniel Ortega Somoza of Nicaragua was not well-liked in Central America.

"It wasn't a quip," Senator Dole said. "It was a very serious interview" with Milwaukee Sentinel reporters.

The senator, an unannounced candidate for the Republican presidential nomination, visited Nicaragua during the monthlong congressional recess that ended Wednesday. During the visit he met Mr. Ortega.

In the interview, Senator Dole suggested that Mr. Ortega is so disliked by other Central American leaders that President Oscar Arias Sanchez of Costa Rica would not object "if somebody came down there and sort of blew" Mr. Ortega away.

"I don't mean kill him," Mr. Dole said. Pressed, he added: "I've got a feeling a little three-day invasion wouldn't make anybody unhappy down there, if you just overthrow Ortega. But that's just my guess."

Later he attempted to back off any implication that he was advocating U.S. military action in Nicaragua. He said that he did not know whether Mr. Ortega's government could be overthrown in three days and that it would be preferable if other Central American nations "can isolate Nicaragua."

Asked how far he is willing to go in seeking a military solution in the region, he said: "I'm not even suggesting that. We don't need to do that."

Asked again Wednesday about the invasion comment, Mr. Dole declined to repeat it. But he added, "I just said some people would not find that too offensive."

Peace Plan Called Flawed

Jack F. Kemp, a conservative U.S. congressman, has opened a campaign to persuade Central American leaders that the peace plan they signed last month is "fundamentally flawed" and "a recipe for disaster" in the region. The New York Times reported from Tegucigalpa, Honduras.

Mr. Kemp said the trip was also intended "in let Congress and the White House know we are not willing to relax our efforts to continue aid to the freedom fighters."

The congressman, along with Senator Jesse Helms, Republican of North Carolina, is the author of a bill to provide \$310 million in assistance to the contra over the next 18 months.

Under a peace plan signed by the leaders of Costa Rica, Guatemala, El Salvador, Honduras and Nicaragua last month, cease-fires are to begin in both Nicaragua and El Salvador on Nov. 7 and outside assistance to insurgents in Central America is to stop.

U.S. officials have expressed at least lukewarm support for the peace plan. They have said that they might seek additional aid for the contra if the plan, which includes pledges by Nicaragua to declare an amnesty and lift restrictions on dissent, were to falter.

For Mr. Kemp and other congressmen, the plan is that while it calls on the United States to halt assistance to the rebels, it allows the Soviet Union and Cuba to continue to supply the Nicaraguan government.

Land Reform Minister Dies in Brazil Air Crash

RIO DE JANEIRO — Brazil's agrarian reform minister and six top advisers have been killed in a plane crash, dealing a severe blow to President Jose Sarney's program to give land to more than one million peasants.

An air force jet carrying the minister, Marcos Freire, and the advisers crashed Tuesday evening just after taking off from an airport at Carajás in the Amazonian state of Para. Witnesses said the plane exploded before the crash.

Mr. Freire and José Eduardo Veira Raduan, superintendent of the Agrarian Reform and Colonization Institute, had been inspecting land reform sites in a region that has been the center of numerous land takeovers and rural violence.

Mr. Sarney said the accident had inflicted a "severe loss" and declared three days of official mourning. Mr. Freire, 56, a former senator from Pernambuco, was a national figure of the governing Brazilian Democratic Movement.

Mr. Freire, a moderate, was Mr. Sarney's fourth minister of agrarian reform in less than three years. His predecessors all resigned under fire from landowners.

He was appointed three months ago to negotiate with the powerful landowner associations, which have armed themselves against peasant land invasions.

The Roman Catholic Church, which actively supports peasant demands for land, has reported the killing of more than 150 people in land disputes since 1985, including two priests and a nun.

Resistance from landowners, lack of funds and shoddy administration of the land distribution program have severely restricted Mr. Sarney's ambitious target of settling 1.4 million peasants in five years.

Mr. Freire said last week that only 17,000 peasant families had been settled under the program last year.

INTERNATIONAL CLASSIFIED (Continued from Back Page)
AUTOS TAX FREE, LOW COST FLIGHTS, EXCEPTIONAL RATES, HOTELS, EMPLOYMENT, DOMESTIC POSITIONS AVAILABLE, EDUCATIONAL POSITIONS AVAILABLE, LANGUAGE SCHOOLS, SECONDARY SCHOOLS, DOMESTIC POSITIONS AVAILABLE, AUTO SHIPPING.

NATIONS: 6 Dots on Europe's Map Make Small Talk

(Continued from Page 1) smallest," said the wife of one of the Luxembourg delegates. "It's a strange feeling to be the biggest."

Vatican City, which has a resident population of fewer than 400 and which was not represented at the meeting, has a secure identity as a steady income as the center of world Roman Catholicism.

But the other mini-nations have to take someone bigger into account and get by on their wits. Malta lives in uneasy proximity to the government of Colonel Muammar Gadhafi in Libya.

Liechtenstein depends on Switzerland for its defense, foreign affairs, transportation and telecommunications. Andorra has historically kept its autonomy by playing France and Spain as they being masterfully placed at the top of an inaccessible mountain range.

The principality of Monaco, with about 28,000 people packed into 1.81 square kilometers, affirms its independence under Prince Rainier 3d but tends to be regarded by France as an eccentric municipality on the Côte d'Azur.

San Marino claims to be the world's oldest republic as well as the smallest, with only 60,577 square kilometers of territory and 24,000 inhabitants.

Once, much of Italy was divided into city-states like San Marino. Being poor, isolated and difficult to invade on top of their fortified mountain in the Apennines, the San Marinese managed to avoid the attention of invading armies by keeping order at home and staying out of other peoples' disputes.

Today, San Marino has official relations with more than 50 countries, including China and the Soviet Union.

"In a world in which power, arms and the supremacy of force determine the lives of people, the experience of the small countries is more important than ever," said Antonietta Bonelli, director of San Marino's department of foreign relations. "We have shown that even with less territory and no weapons, you can live happily."

As in the past, San Marino's survival depends on harmonious relations with Italy, which surrounds it. In the 1950s, when the tiny republic elected a Communist government and opened a casino, Italy sent a squad of carabinieri to blockade its 31-kilometer-long frontier with San Marino. More recently, because of its open frontiers with Italy, San Marino has had to take on some of the tax and other obligations of the European Community without getting many of the benefits of membership, Mr. Giardi said.

Liechtenstein owes its wealth partly to its status as a tax haven for thousands of foreign companies that have put up brass plates in Vaduz, the capital, partly to tourism and partly to the development of light industry, such as the manufacture of false teeth.

Prince Franz Josef 2d, the last of the Habsburg monarchs, has reigned since 1938. The prince, 82, has turned over the day-to-day running of the country to his son, Prince Alois. Liechtenstein has no army, 57 policemen and one ambassador, who is based in Bern.

Etienne Franz, the delegate from Monaco, was enthusiastic about the charms of his haven for the wealthy.

Apart from a situation in which many of the 5,000 native Monegasco residents find it hard to afford the price, is there anything wrong with life in there? "Honestly," Mr. Franz said, "I can't think of a single one. The proof is that everybody wants to go and live there."

DOONESBURY comic strip panels. Panel 1: 'WHO IS SIGNING THE RECALL PETITION? THEY FIT NO DESCRIPTION. THESE ARE DEMOCRATS OF COURSE. THERE ARE BLACKS, HISPANICS, THERE ARE WOMEN AND GAYS.' Panel 2: 'BUT THERE ARE ALSO REPUBLICANS. IN FACT, THE RECALL MOVEMENT IS BEING LED BY A MEMBER OF THE GOVERNOR'S PARTY!' Panel 3: 'SO WHAT LINKS THESE DISPARATE ARIZONAINS? IN A WORD, EMBARRASSMENT.' Panel 4: 'SO WHERE YOU FROM, FELLAH?' Panel 5: 'U.H. NEW MEXICO.'

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# Technology Quarterly

Issue No. 2

## DEPARTMENTS

### At Home 8

One of the only sure bets at the Frankfurt Auto Show opening Friday is the world debut of the BMW Z1 roadster. But some observers think Ferrari's F40 — the fastest road-going car available — might steal the show.

### Business 9

Safer flying is one of the aims of a technologically advanced device for airplane cockpits called head-up display. The device in tests has enabled pilots to land manually in conditions that would have closed an airport.



### Computers 10

Western nations are easing rules on computer exports to the Soviet Union, but one longtime critic argues that doing so could be fulfilling Lenin's dictum that capitalists will produce the rope needed to hang themselves.

### Workplace 11

Clocking in on Platform 6 at 7:40 A.M., office staff of Asea, Scandinavia's largest maker of heavy electrical equipment, take to their desks in the world's first railborne mobile office.

### Research 12

Although scientists continue to debate exactly why and how it works, the process of applying electricity to aid in the repair and growth of bones soon may be extended to an array of other problems, ranging from osteoporosis and osteoarthritis to spinal fusions and skin ulcers.

### Developments 13

Justice Marshall's "takeover bids, joint ventures, international acquisitions and knowhow sales are proliferating in the carbon business — but that is Hispanic's view." Because carbon is becoming high-tech.

### Next Issue

New technologies are aiding archaeologists in unlocking the mysteries of the pharaohs. Car-makers are finding the team approach to automated manufacturing isn't always the solution. These and other issues on Dec. 15, in Technology Quarterly.

## Nations Divided on Ozone Accord

By Thomas Netter

**G**ENEVA — In a last-minute hitch that could derail an historic agreement to save the Earth's vital ozone layer, the United States — and several other industrialized countries — have added potentially divisive proposals to the agenda of an international ozone conference in Montreal, environmentalists said Wednesday.

A new U.S. proposal, said to come from the White House and backed by anti-regulatory elements in the U.S. departments of Commerce and the Interior, would require 90 percent of the world's manufacturers of ozone-destroying chlorofluorocarbons, or CFCs, to ratify an agreement before it comes into force, according to David D. Doniger, an attorney at the National Resources Defense Council in Washington.

This measure, which Mr. Doniger said has the support of the Soviet Union, would allow Moscow and almost any other country to effectively veto an agreement because the Soviet Union produces 10 percent of world CFC production.

But the new U.S. proposal, raised during preliminary meetings in Montreal this week, is only one of several proposals that could make next week's meeting difficult, Mr. Doniger said. The European Community has proposed eliminating an important category of CFCs from the accord and lumping all 12 member state's production together, so a production

## Environmentalists Fear Last-Minute U.S. Proposal Could Derail Agreement

decrease by one could allow an increase by another, Mr. Doniger said.

At issue is whether the ozone layer can be protected by an international treaty or whether alternative means, such as individual measures involving sunglasses and hats as proposed by some anti-regulatory U.S. officials, should be used.

Ozone is a special form of oxygen that reaches high concentrations in the stratosphere 10 to 30 miles (16 to 48 kilometers) above the Earth. This protective layer permits life on Earth by filtering the sun's harmful ultraviolet rays. If unimpeded, these rays can cause skin cancer, eye problems and reduced crop yields. In the early 1970s, scientists found that certain chlorine-based chemicals were gobbling up the ozone layer at an alarming rate.

These chlorofluorocarbons stay intact until they drift into the stratosphere where they disintegrate, their fragments destroying ozone. The gases are also believed to contribute to the warming of the atmosphere, the so-called greenhouse effect that results

when gases prevent radiant heat from the sun from escaping the Earth's atmosphere.

CFCs provide the spray in many aerosol spray cans, the cooling agents for refrigerators and air conditioners, the cleaning agents for computers, and the foam in foam rubber.

In 1978, the United States and Canada banned the use of CFCs in aerosol spray cans, causing a temporary decline in emissions. Most European countries, however, acted only to prohibit the construction of new plants producing this chemical. The chemical is still widely used for other applications. For year, industry produces about 600,000 metric tons of CFCs.

The discovery of a growing "hole" in the ozone layer over Antarctica and parts of Switzerland that scientists suspect is caused by CFC emissions, has given new urgency to the issue.

In the most thorough study to date, a team of 150 experts organized by the National Aeronautics and Space Administration is conducting flights in the area this month to determine whether the "hole" is being caused by industrial pollution. The hole over the Antarctic appears each year in mid-September at the end of the southern winter. The amount of ozone decreases to less than half its normal density before returning to normal levels in October.

Other scientists are studying the Arctic skies, where a transitory thinning of the ozone layer was detected in February and March last year.

The meeting in Montreal, which is organized by the United Nations Environmental Program, is seeking to put the finishing touches on a tentative agreement

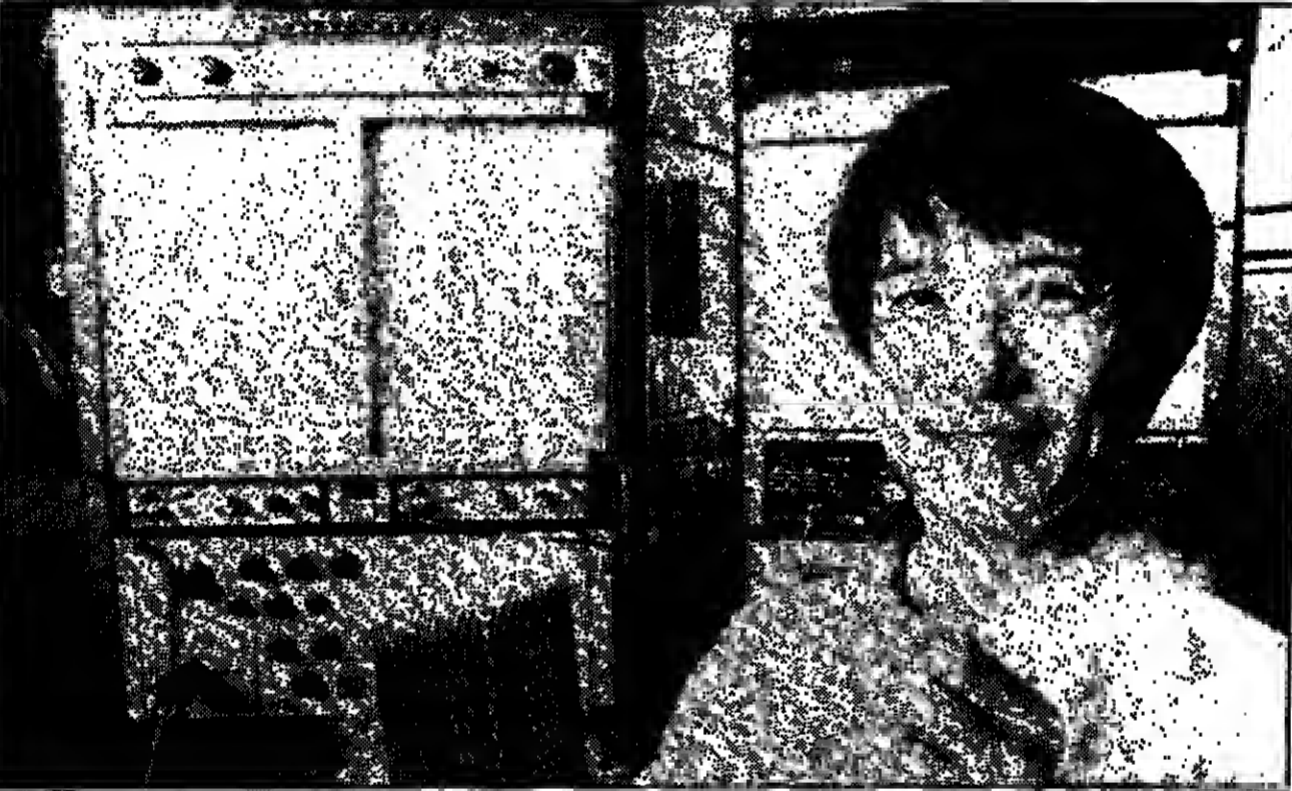
Continued on page 13



Over South Pole, a hole in stratospheric ozone has expanded to cover an area as large as the United States. Ozone protects the Earth from harmful ultraviolet rays.

## Ytterbium? Or How a Typo Set Off Scientific Scramble

By James Gleick



Ching-Wu Chu in his superconductor lab at the University of Houston.

**C**ERTAIN American scientists wasted some time recently trying to make a superconductor out of the wrong element. They were chasing a phantom — a typographical error by the physicist, Ching-Wu Chu. Certain American scientists believe that the error was no accident.

Mr. Chu, 36, stunned his colleagues and competitors in laboratories around the world last February by announcing the discovery of a new material that would make the phenomenon of superconductivity commercially feasible at last. But he refused to name the material before the official publication of his discovery, which was weeks away.

His claim set off a stampede. For experimenters struggling to take part, a hellish month followed — a month of tense days and sleepless nights. A practical superconductor, a material through which electricity flows without losing even the smallest fraction of its energy to resistance, would be a turning point in scientific history. Scientists were glimpsing a new age of electricity — a world of absurdly cheap power and trains floating in the grips of magnets. Enormous corporate interests were already at stake. Patent lawyers were chaperon-

ing the research teams like pilot fish surrounding sharks.

So Mr. Chu's incomplete announcement was every scientist's nightmare: the breakthrough of a generation, and someone else had the secret formula.

"It was gruesome," said Robert J. Cava, a member of a team at the American Telephone & Telegraph Co.'s Bell Laboratories, one of the major institutions near the forefront of the research. "There was a lot of pressure on us to figure out what was going on."

The Bell researchers say they remained in the dark until the last days before publication, but other scientists heard a provocative rumor: that the esoteric element ytterbium was the key to the new superconductive material.

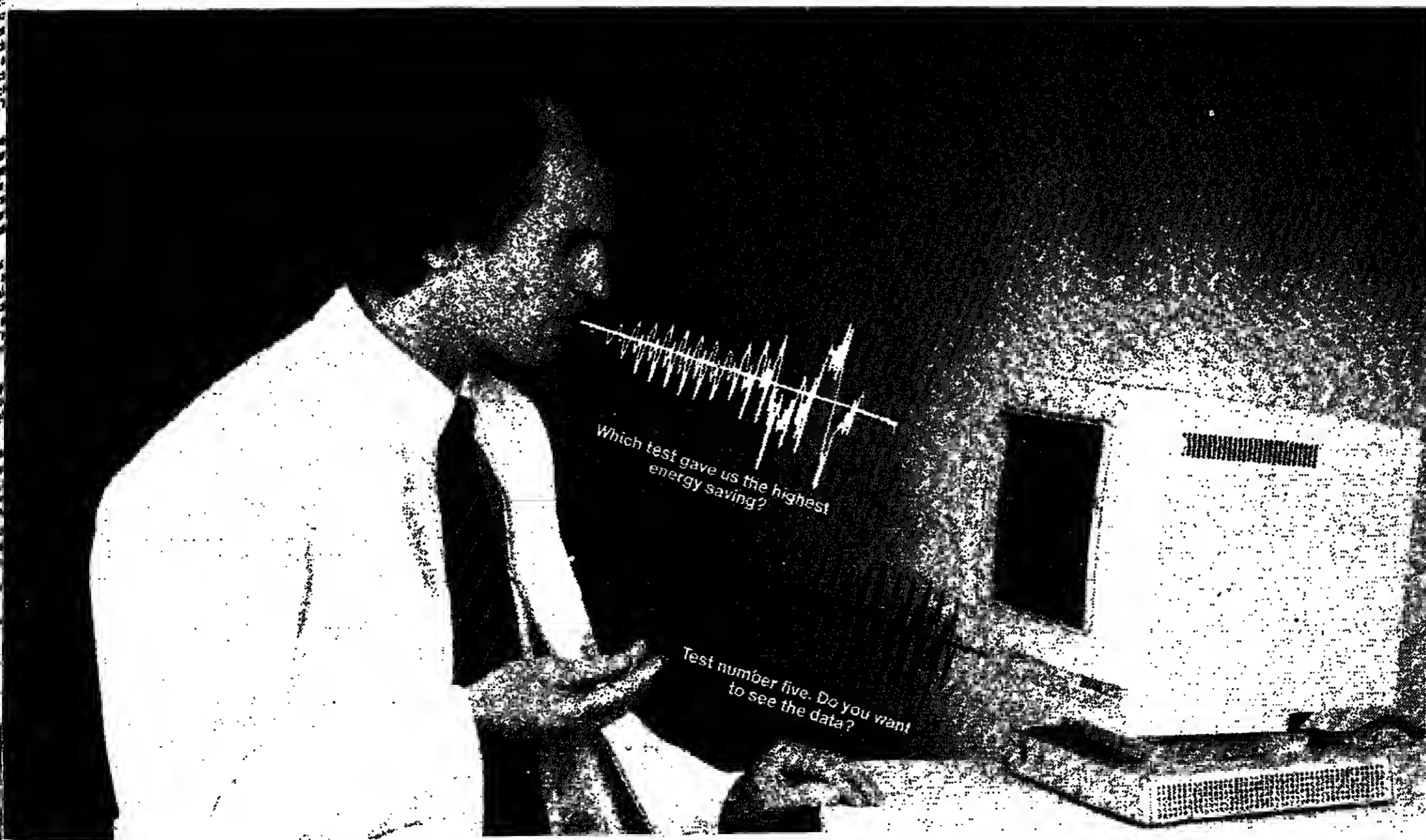
Ytterbium was indeed the element named in the manuscript that had been submitted by Mr. Chu's team, relative unknowns at the University of Houston, to *Physical Review Letters*, the premier journal for reporting breakthroughs in physics. But when the journal appeared on March 2, the final paper named a different element, yttrium.

Mr. Chu had pleaded with the journal for special handling, insisting on secrecy, fearful that the editors would leak. "Which we now know they did — like a sieve," said Arthur J. Freeman, a theoretical physicist at Northwestern University. "Only they leaked ytterbium instead of yttrium. I had heard for weeks that the material was ytterbium, and now I know where it came from."

As news of the yttrium-ytterbium affair Continued on page 12

JAMES GLEICK, a science reporter for *The New York Times*, is the author of "Chaos: Making a New Science," to be published by Viking in October.

## This computer needs no keyboard for communication. It understands plain English.



AEG is developing an automatic speech recognition system by which computers of future generations will correctly react and answer to spoken instructions. This dialogue with computers is becoming more human.

## Innovative technology from AEG. Here's more:

**285** AEG uses the "Chip on Glass" technique for LCD type displays. Advantages: the display and driver electronic system are combined into a single unit, so the number of contact points is reduced to a minimum. This leaves the display back clear, allowing optimal rear illumination. Result: high brilliance at any time of day.

AEG supplies efficient electronic systems for environmental protection purposes: contaminants contained in both air and water can be automatically identified and analyzed, and there can be exact control of processes in waste incineration, exhaust gas purification or water treatment. In the event of operating trouble these "intelligent" microcomputers automatically contact the central system via the phone.

AEG's grouped networking is contributing to the economic use of the radio bands. Radio channels are bundled and managed by a computer, then allocated to subscribers as required. Communication bottlenecks are a thing of the past. This technology offers a number of characteristics not found in the usual radio networks. Grouped networking from AEG — already in successful operation in Schiphol airport Amsterdam and under construction in Frankfurt.

# AEG

Technology At Home

# Frankfurt Auto Show to Offer Some Souped-Up Surprises

By Michael Rutherford

**L**ONDON — Major European motor shows are unpredictable events renowned for their last-minute unveiling ceremonies and surprise announcements.

Take, for example, the Geneva show last March: Aston Martin revealed its new, razor-sharp Lagonda to a stunned press and public; a Bentley Turbo R built by British coachbuilder Hooper was unveiled and immediately hailed as the "most expensive car ever to be produced for private sale." And Chrysler caught everyone with their guard down by announcing the brave (some might say foolish) decision to re-enter the fiercely competitive European market, where the Chrysler image is, at best, tarnished.

If the comparatively tame and unexciting Geneva show was capable of springing these kinds of surprises and more, it is anyone's guess what might happen at the 1987 Frankfurt show, which opens on Sept. 11. Frankfurt, probably the event in the European motor show calendar, is likely to be full of surprises.

Not many people can safely predict exactly what will go on show. In fact, one of the only things that is 100 percent certain to happen at Frankfurt is the world debut of the BMW Z1 roadster. The company is reportedly fed up with scoop photographs, assumptions, claims and doubts surrounding the car and has, therefore, decided to "put an end to supposition and rumor" by displaying the car on home soil.

The Z1, officially described as a "limited edition, mid-engined sports car" will go into production and on sale next summer. It is the brainchild of a small, young BMW offshoot, BMW Technik GmbH, which was set up by BMW AG as an autonomous operation with the objective of developing forward-looking products and processes.

The bold claim from Bavaria is that the Z1 is "eight years ahead of the average souped-up mass-production car." It is based on a monocoque-style load-bearing skeletal steel chassis to which thermoplastic panels are hung. The plastic outer skin and bumpers/fenders help to keep the weight of the car down, and resistance to minor damage is assured, BMW says.

Although the two-seater Z1 can, according to the manufacturer, be driven in open-top form with scarcely any turbulence to disturb the occupants, there is an easy-to-use, leak-free soft top.

Beneath the skin, the Z1 boasts a variety of features lifted from current, highly successful BMW saloons. Initially, it will be powered by the new BMW 325i's six-cylinder engine. The low-pollution version with catalytic converter has "of course" been chosen, says BMW, which claims that the power pack accelerates the car from rest to 62 miles per hour in seven seconds.

Although BMW calls its new offering a mid-

engined car, the straight six engine sits just behind the front axle, which gives a near 50/50 weight distribution. Power reaches the rear wheels by way of a five-speed manual gearbox and a prop shaft running in a rigid aluminum tube to the rear differential, which is also made from aluminum.

The suspension uses BMW 3-series front spring damper struts and, at the rear, a Z arm layout of entirely new design. Handling is said to have a hint of go-kart immediacy about it.

With its wide track, low center of gravity and 49/51 rear axle load distribution, the Z1 has "more than adequate top speed," and everything needed for safe, predictable road behavior and abundant driving pleasure, says BMW.

The price of the Z1 is likely to be about £25,000 (\$40,000) when it goes on sale next summer. At that price, the car will be a certain sellout, particularly as only six a day will be produced. Launched to the world's press a couple of months ago, the Ferrari F40 (working title, Ferrari Le Mans) seems certain to take the stage at Frankfurt and might just steal the show from the BMW Z1.

The public will see the F40 for the first time at Frankfurt, and what they will see is the fastest road-going car available from a manufacturer of production cars. Admittedly, that claim has been made by Ferrari itself — but few would argue. The F40's official maximum speed is a cool 201 mph, and acceleration from rest to 124 miles per hour takes a mere 12 seconds.

Never before has so much overt racing technology been applied to a road car. The F40 (F

for Ferrari, 40 because it celebrates 40 years of "supercar" production) has a stark interior, tubular steel chassis with carbon fiber reinforcement, and also features Kevlar, a stronger-than-steel fiberglass material more commonly used on Formula 1 racing cars.

Rubber bag fuel tanks are also part of the F40 package, along with an automatic lowering suspension system.

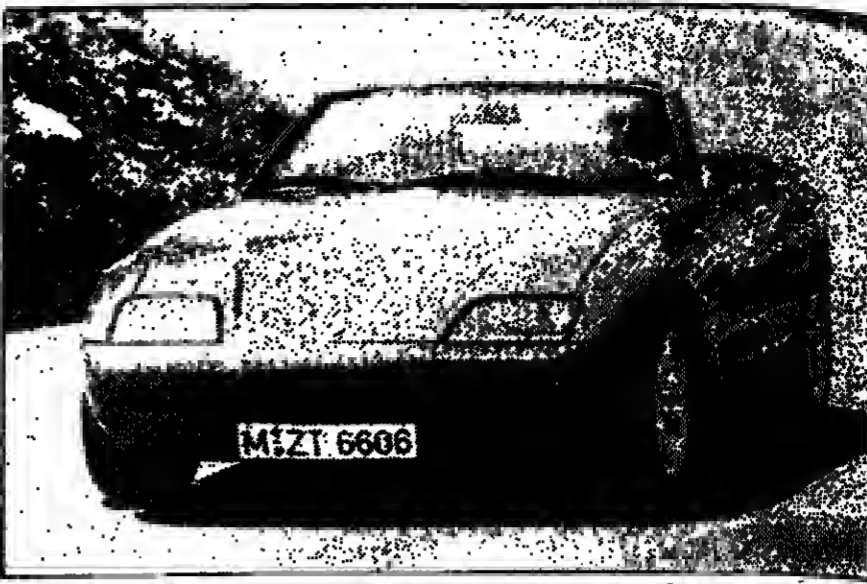
Beneath the car's lowered rear window, the longitudinally mounted V8 is clearly visible. It has twin turbochargers that help to produce a massive 478 bhp at 7000 rpm.

Only 450 F40s will be built, with deliveries being made starting in the spring. The V8 engine has the ability to meet U.S. emission requirements.

The basic price of the car in Italy is 270 million lire (\$201,000), plus car tax and value added tax. For that money, buyers will be invited to select a driving seat that matches their particular body shapes. And they will also go through a two-day "familiarization session" with their cars.

As if to prove that state-of-the-art technology is not the sole property of the dream-car manufacturers like BMW and Ferrari, Ford will be tempting Frankfurt visitors with its own brand of more affordable high-tech wizardry. The company's latest showpiece, designed and built jointly by the U.S. Light Truck division in Dearborn, Michigan, and the Ghia design studio in Turin, is the HFX Ghia Aerostar—a so-called "family driving machine" for the next century.

Ford is serious about the HFX project, so



BMW's "limited edition" monocoque-style sports car, the Z1.

much so that \$7.2 million and 27 months have already been invested in it.

The HFX is a six-seater, van-like vehicle powered by a three-liter V6 engine driving through a four-speed automatic transmission to the rear wheels. The suspension has a conventional layout, but uses air-springing from the Lincoln Continental and liquid-filled bushes for insulation of vibration.

The HFX's all-disc braking setup incorporates Bendix anti-lock and anti-spin devices, while the rack and pinion steering has speed variable assistance provided by an electric motor.

The Ghia-built steel body (which retains the basic shape of the standard Aerostar) has flush glazing and sensor-controlled radiator louvers. As might be expected, interior gadgetry is

extensive. There is a dot matrix instrument pack with a choice of three gauge styles, and a touch-sensitive screen for controlling air conditioning and trip computer functions. At the touch of a switch, rear windows can be "fogged" for privacy. A laminate using liquid crystal technology is responsible for the fogging process, which, sensibly, cannot be used on the windshield or front-door glass.

No less than 26 computers on board the Aerostar HFX are capable of adjusting/memorizing seat settings, seat belt mountings and even pedal settings.

Among other manufacturers, Alfa Romeo will finally put on display the much talked about 164; Audi Volkswagen is bound to pull the wraps off something (the new Scirocco or Audi 50 Coupe perhaps); and Jaguar, keen to establish a stronger foothold in West Germany, may also surprise everyone by showing something for the first time. The fully convertible XJS has already been spotted undergoing "secrecy" testing in Britain.

Mercedes and Porsche are also expected to reveal new and exciting models on home ground. The new Mercedes SL sports car, for example, should make its debut at the show although nobody within the industry is putting money on it. A safe bet is that Opel will show the nippy Corsa GS, which is about to challenge current offerings in the competitive hatchback sector.

Rivalry will be intense among Japanese manufacturers at Frankfurt. Honda and Mazda are racing each other to be the first to introduce four-wheel steering on cars in European showrooms. The latter has also just released a convertible RX7 in Japan, which means a European debut for the car is due. Toyota, which is rumored to be looking seriously at establishing a European production plant similar to the Nissan factory in the northeast of England, may be introducing several important new variants at Frankfurt. The new Corolla range is the most significant.

MICHAEL RUTHERFORD is news editor of Motor, the London weekly magazine.

## Final Score at Buick: Buttons 1, High Tech 0

By John Holusha

**H**IGH TECH is not the answer to every problem, officials of the Buick division of General Motors have learned. When a new and distinctly smaller Riviera model was introduced in late 1985, Buick decided to compensate for the lost bulk with gee-whiz electronics.

In place of familiar controls for the radio, heater, fan and air conditioner, the car's instrument panel was dominated by a touch-sensitive cathode-ray tube. Drivers would touch one section of the screen to call up command displays, then tap other spots to change the station, lower the temperature or check gauges.

But drivers found the screens confusing and difficult to operate. And they had to take their eyes off the road to tap just the right spots on the screen in just the right sequence. "The Riviera's setup does nothing that a conventional array of knobs, buttons



and analog instruments could not do in a fraction of the time one spends dithering with this microcircuited mess." Car and Driver magazine observed in a review.

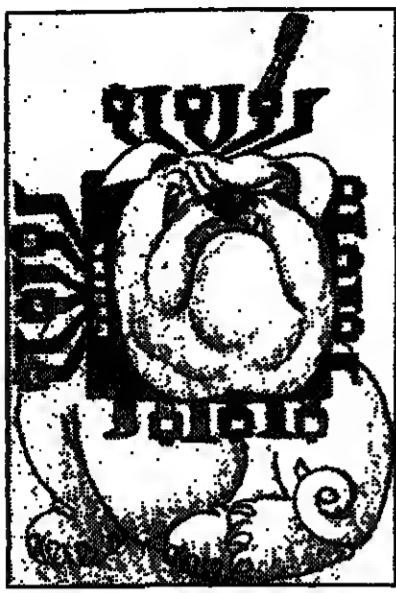
All the interior functions were controlled by the screen, so replacing it would have been expensive. And providing an electronics officer, as the air force often does, didn't seem very practical.

So Buick replaced the areas of the screen that control different functions with raised

buttons that could be operated by feel. Within the screen, it made the touch-sensitive areas larger — easier to hit. But it also added screens to control a tape player, cellular telephone and an appointment calendar.

"There may be no good way to do it, with all there is on the car," one Buick engineer commented.

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## Sensory Assault

**W**HATS next for the modern flea-bitten pet? An electronic collar that will break the eardrums of any pest coming within a few feet.

Elexis Corp. of Miami has developed just such a device — an electronic collar for dogs and cats that emits a high-frequency sound that disrupts the sensory system of fleas and ticks.

The collar, called Microtech, employs a technology known as pulse-modulated burst circuit that creates a high-intensity sound beyond the audible range of dogs and cats but deafening to fleas.

"To a flea, it sounds like a jackhammer and that makes them run for cover," said Dr. Robert W. Stone, chief of staff at Knowles Animal Hospital in Miami.

Dr. Stone said that in hospital tests the electronic collar proved to be 60 to 90 percent effective in reducing the number of fleas on pets. (NYT)

## Contact Lenses To Throw Away

**V**ISTAKON Inc., a Florida-based subsidiary of Johnson & Johnson, has begun market testing of disposable contact lenses.

The lenses, which are 52 percent water and made of standard contact-lens plastic, require no cleaning and can be worn for about a week before being discarded.

The company estimates that using the disposable lenses would cost an average \$520 a year. The lenses are being sold in Florida in a six-pack and are available for overseas shipment only.

The U.S. Food and Drug Administration approved the lenses as disposable products in July. They had previously been approved for extended wear. (AP)

New materials give wing to the creativity of designers.



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atures. Experience has shown that such developments in the aircraft and aero space industries provide important stimuli for other markets.

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## NOTEBOOK

### New TV Tube

THE IDEA OF A PERFECTLY flat-surfaced tube was tested, and the results rejected as being too expensive. The idea was originally developed by Zenith Electronics Corp. has returned to the drawing board. Zenith's new tube for color televisions, which went on sale in the United States last month, appears to offer significant improvements in picture quality and reduced power consumption. The tube is expected to be incorporated into flat televisions in the next year. A spokesman for Zenith Electronics said.



Smith Workers checking a flat television tube.

## Passing Taste

EXILES AT A LOS ANGELES County Fair re-visited the gold medal for a white wine entered by the people of San Jose. What they did not know was that the wine was a blend of claret, red wine and white wine.



Most delectable wines have distillation drive off the heat, but the evaporates aromas. At a cold filtration called reverse technology developed

reverse osmosis, also known as ultrafiltration, is a porous cylindrical membrane. Because of the membrane, rather than through pores and very small pores can be used. Since they are the smallest molecules, they pass through, leaving a syrupy wine concentrate behind. "It is the point where I'm filtering molecules at the atomic level," said Barry Gockow, Arizona adds the water back, sometimes with a balanced juice, to create Ariel's nonalcoholic sandwiches two membranes — one a demineralizer and the other thicker and more porous membrane and a high-pressure flow. This is less intrusive than many used in modern water treatment. Ariel's president, "The wine is like alcohol," he said.

## Fiber Optics

GENEVA. A NEW fiber optic television and sound system being installed throughout the city of Geneva for a variety of broadcast programs and computer data links.

Using fiber optic and coaxial cables, a firm called BLEGNEVE S.A. and formed by private investors, is installing a network of cables that will connect up to 30 local and foreign radio programs, the Swiss National Television and the Voice of America. The network will also provide up to 40 television channels and 40 radio channels from the United States and the Soviet Union.

"Geneva" won't cost much, officials say. Viewers will be able to watch French-language Swiss television transmissions of the three major networks. The fiber optic network is also expected to link up Geneva with other major cities in Europe because of its well-developed banking and business interests.



## Talking Phones

DEPENDENT PAY PHONE operators in the United States are turning to new technology to compete with independent pay phone companies. Already available are pay phones ready to give callers video displays, advertising messages and other services. Others accept credit cards and offer services. Pay phones are also being developed for use on ships.

People too busy to wait, the best yet is Messer's. The caller has left a pay phone in a public place, dialed a busy telephone number from the caller and then redials the number. A connection is established and the record is played.



Technology Business

NOTEBOOK

New TV Tube

THE IDEA OF A PERFECTLY flat-surfaced color picture tube was tested, and reluctantly rejected as being far too complex, in the 1950s when color television was young. Now, using an advanced design that was originally developed for use in military avionics, Zenith Electronics Corp. has returned to "flat technology" with a new color monitor for computers.

The flat technology monitor, which went on sale in the United States last month, appears to offer significant advantages over conventional cathode ray tube (CRT) monitors in brightness, contrast, color fidelity and reduced glare.

The flat technology will also be incorporated into some of Zenith's color television sets next year, a spokesman for the Glenview, Illinois, company said. (NYT)



Zenith Workers checking a flat technology monitor.

Passing Taste Test

JUDGES AT A LOS ANGELES County Fair recently awarded the gold medal to a white wine entered by Ariel Vineyards of San Jose. What they did not know until later was that the wine, Ariel Blanc, a blend of chenin blanc and riesling, was a de-alcoholized wine.



Most de-alcoholized wines have been made through distillation methods that drive off the alcohol with heat, but the heat also evaporates flavors and aromas. Ariel instead uses a cold filtration process called reverse osmosis, a technology originally developed for desalination.

In reverse osmosis, also known as ultrafiltration, the wine flows along a porous cylindrical membrane. Because the liquid flows along the membrane, rather than through it, very high pressures and very small pores can be used. Since alcohol and water are the smallest molecules, they pass through the membrane, leaving a syrupy wine concentrate behind.

"It's to the point where I'm filtering molecules, particles just above the atomic level," said Barry Gnekow, Ariel's wine maker, who then adds the water back, sometimes with a small amount of unfermented juice, to create Ariel's nonalcoholic wines.

Ariel sandwiches two membranes — one a dense but thin film polymer and the other thicker and more porous to permit greater retentiveness and a high-pressure flow. The result is a process less intrusive than many used in modern wine making, said Larry Leigon, Ariel's president. "The wine is the flavor, not the alcohol," he said. (NYT)

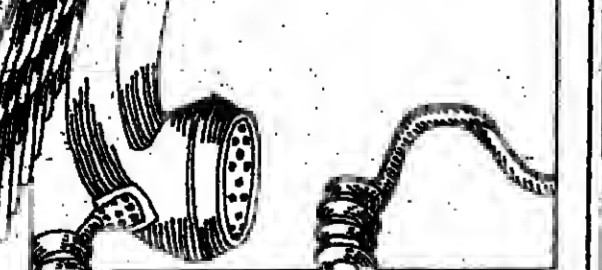
Fiber Optics

IN GENEVA, A NEW fiber optic television and radio network now being installed throughout the city is to open up a large variety of broadcast programs and computer links over the next four years.

Using fiber optic and coaxial cables, a firm called 022-TELEGENEVE SA, and formed by private investors and the city, is meshing Geneva with a net of cables that will provide viewers with up to 30 local and foreign radio programs including Armed Forces Network and the Voice of America. It will also provide up to 40 television channels, including Cable News Network from the United States and something called Gorizon from the Soviet Union.

"It won't cost much, officials say. Viewers accustomed to one channel of French-language Swiss television and sometimes blurry transmissions of the three main channels of French television may find it a real bargain.

The fiber optic network is also expected to link up computers in Geneva, which has the highest density of high-tech computers in Europe because of its well-developed service, banking and business interests. Thomas Netter



Talking Phones

INDEPENDENT PAY PHONE operators in the United States are turning to new technology to compete with the established Bell operating companies. Already available on a limited basis are pay phones ready to give callers verbal instructions, present advertising messages and operate with computerlike video displays. Others accept credit cards, operate in taxis and limousines and let users choose among competing long-distance services. Pay phones are also being deployed on trains, jet aircraft and ships.

For people too busy to wait, the best yet is Message Phone Inc., which will continue to dial a busy telephone number long after the caller has left the pay phone. The phone records a message from the caller and then redials the number for up to two hours until a connection is established and the recorded message is played. (NYT)

Futuristic Cockpit Device Enhances Safety in Air

By Mark Patfky

WASHINGTON — Changes in aircraft cockpit design are slow in coming. Only within the last four years, for example, has electronic flight instrumentation come into its own on the airliner flight deck.

So, despite decades of space age promise, commercial aircraft are finally achieving a level of instrument sophistication that Apple Computer Corporation has been showing grade school students since the late 1970s.

NASA designers and engineers say the cockpit of the future will take far greater advantage of current computer graphics capability, creating full color, visual images rather than pure digital instrument indications in vogue today.

Using compact, airborne radar and infrared sensors plus data up-linked from the surface, pilots will see actual representations of land masses, hills and valleys. They will see runways in proper relationship and other nearby aircraft with far greater precision than the misaligned human eye. And the computerized flight deck will display equally well in visual or instrument conditions.

Although this future may be sometime off, a device called HUD, for head-up

display, is here today. HUD offers a new dimension in aircraft instrumentation and a level of sophistication that promises a major enhancement in air safety.

The device allows pilots to continually look outside their cockpit while seeing instrument indications superimposed on the exterior view. In the current high density air traffic environment, the opportunity to continuously scan outside, dramatically decreases the chances for midair collision.

In light of the recent increase in reported airliner near-collisions, HUD takes on particular significance. High density airport traffic operations demand close attention to the outside environment. This is exactly the time when a pilot must maintain continual reference to instruments inside the cockpit. HUD offers a solution by presenting instrument indications against a clear external view.

In addition, the device offers facility for making low visibility approaches in the worst weather conditions, day or night. HUD has been demonstrated totally safe in allowing pilots to manually land in conditions that, previously, would have closed an airport or required costly unaided capability.

Currently two U.S. companies are developing and manufacturing commercial head-up displays. In 1985, Oregon-based Flight Dynam-



Head-up display, or HUD, helps pilots to avoid collisions.

ics Inc. received full Federal Aviation Administration approval and certification for HUD on the Boeing 727. Last month in conjunction with laser gyro, inertial navigation systems, a standard long-range navigation aid already aboard many domestic and trans-oceanic aircraft, the system was certified to assist an aircraft's encounter with windshear

and provide guidance for flying through it. Jet Electronics and Technology, in Grand Rapids, Michigan, is also manufacturing a similar though slightly less sophisticated system for corporate aircraft.

Essentially, HUD is a small glass window that sits on top of the pilot's glare shield. A series of instrument symbols are projected onto the glass with a virtual image focused at infinity. This allows the pilot to see the outside view plus instrument indications superimposed, without shifting his focus.

On most conventional instrument approaches, the pilot is looking at his instruments. As he descends to the published minimum safe altitude, possibly 100 feet (30.4 meters) above the ground, he must look up and search for visual clues.

A normal human being takes four to five seconds to refocus and mentally assimilate the new image. In this case, the aircraft will be 50 feet lower before the pilot has responded, therefore, reducing safety margins considerably. HUD eliminates this lapse by maintaining the pilot's view and focus at outside infinity for the entire approach.

Windshear enhancement is also part of the order for Alaska Airlines and Federal Express from Flight Dynamics. Not only is the pilot warned that windshear condi-

tions are impending but flight guidance information is provided for a safe recovery when the full windshear is detected.

But despite its full availability, HUD has been slow to take off. Currently, Federal Express is installing six systems to allow its overnight package service to fly more regularly into often fog-bound West Coast airports. Alaska Airlines, with similar requirements, has recently purchased eight systems with 12 more on order.

The "bottom line" in airline operation is generally the deciding factor where safety enhancements are concerned. The Flight Dynamics system could cost between \$170,000 to \$330,000, depending on the retrofit problems. JET's device for corporate aviation sells for about \$100,000, without any consideration for the replumbing.

It is, therefore, unfortunate to learn that safety has a price tag, particularly when the promise of tomorrow is already on the suppliers shelves. As the two airlines prove the value of HUD, hopefully other operators will follow.

MARK PATFKY, who writes on aviation, is the author of "Investors' Guide to the Strategic Defense Initiative," to be published next month by KCI Communications in Arlington, Virginia.

Advertisement for AC Catalytic Converter. The ad features a large, stylized image of a car's rear end with the letters 'AC' prominently displayed. Text includes: 'AC CATALYTIC CONVERTER', 'AC offers European vehicle manufacturers catalytic converter and emission control system knowledge to satisfy the design, test, development and application needs for today and the future.', 'Supporting this expertise are worldwide production and engineering facilities, providing the local services required in this dynamic business environment.', 'So if you're looking for someone who knows catalytic converters inside and out, talk to us. We've been down this road before.', 'AC MAKES MORE PARTS FOR MORE VEHICLES THAN ANY OTHER COMPANY IN THE WORLD.', 'AC SPARK PLUG OVERSEAS CORPORATION, P.O. BOX 336, SENTRY HOUSE, 500 AVEBURY BOULEVARD, CENTRAL MILTON KEYNES, MILTON KEYNES MK19 2NH.'

TechnologyComputers

PCs Are Still Waiting At Executives' Door

By Sherry Buchanan

LONDON — The personal computer has yet to make it into every executive's office...

Although there are enthusiasts among executive personal computer users, others are finding they might have been better off getting one for their secretary...

Some British experts believe that many general managers are simply afraid of new technology...

These managers exhibit all the weaknesses and problems people do when they become fearful of their position...

Tomorrow's top exec will be more familiar with computers; whether that will carry over into the executive suite remains to be seen...

In the Business Computing & Communications study, executives found personal computers to be essential for word processing...

The higher executives go, the less they are interested in using the personal computer themselves...

SHERRY BUCHANAN writes the International Manager column for the International Herald Tribune.

Regardless of how industry is presenting the product, executives are not going for it...

Executives spend the majority of their time talking to people, in meetings or on the telephone...

Some British experts believe that many general managers are simply afraid of new technology...

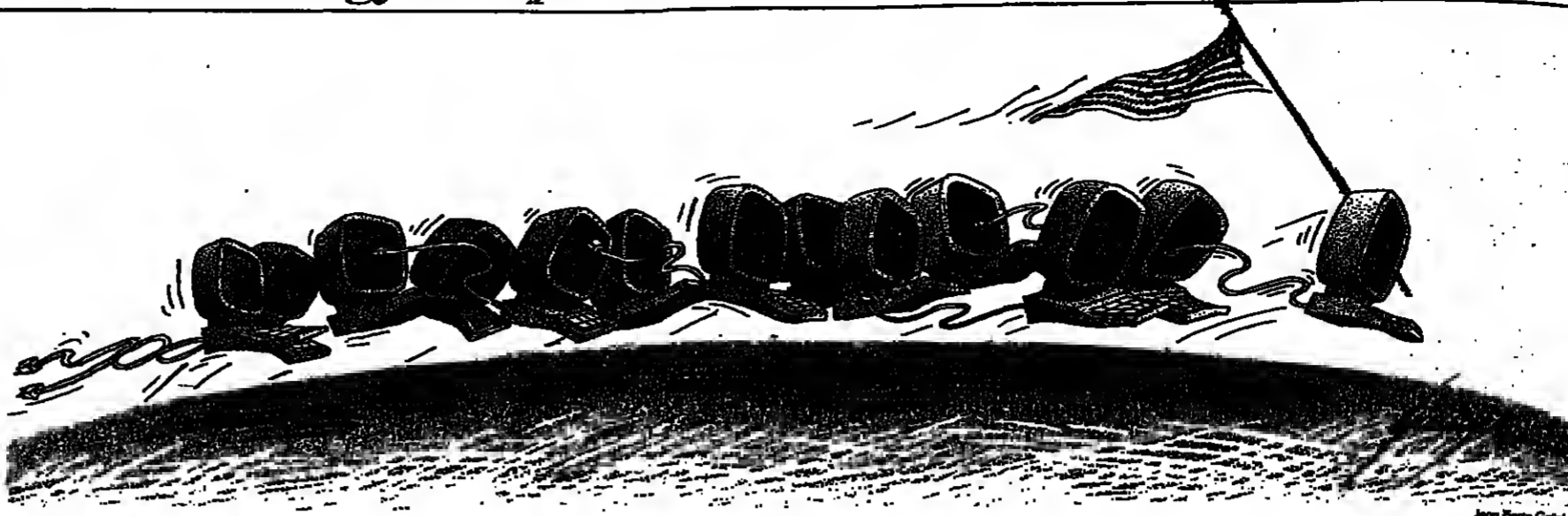
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Soviets Set to Access the West

By Barry James

PARIS — Bowing to what seems like the inevitable, Western nations are in the process of relaxing their ban on personal computer exports to the Soviet Union...

With the machines freely on sale at thousands of stores in the West, and available in bulk on many alternative markets...

Recently, for example, the Soviet Union was reported to have bought a large order of IBM-compatible PCs from Peru...

"If the Soviets need computers, they can buy all they need without any trouble," said Seymour Goodman of the University of Arizona...

The opposing view is that anything that makes it easier for the Soviets to acquire computer technology is a gift to their military effort...

He said in a telephone interview that he feared the relaxation of computer exports would lead eventually to the setting up of joint-

venture production facilities in the Soviet Union, an eventuality in which Moscow already has expressed interest...

money to buy computers from the West in large numbers, or any clear idea of what they would do with them if they did...

available at Moscow's only electronics store, on Leninsky Prospekt.

A reporter for Komsomolskaya Pravda told in his newspaper how he visited the store and filled out an application form for one of the computers...

"You should read less," the assistant replied. "Why?"

"Because we don't have any computers, and we won't have any."

"But don't you have them on sale from time to time?"

"Not even one."

"The public use of computers barely exists," Mr. Goodman said. "There are certainly not enough machines around for a computer revolution."

Apart from the BK-0010, the Soviets also produce a machine called the Agat, closely based on the Apple II, which is used in schools...

The only known civilian networking system in the Soviet Union is the one operated by the Academy of Sciences for the exchange of scientific data between Moscow and the Academic City, Akademiyskiy dok, outside Novosibirsk...

Mr. Goodman said the Soviet Union is far ahead of China in its application of computers, but it is acutely aware of its growing technology gap with the West...

Despite such handicaps, Mr. Goodman said, the system succeeds in producing some fine computer experts. "It is a big country in which the educational system is oriented toward science and technology..."

BARRY JAMES is a staff writer for the International Herald Tribune.

Decontrolling the export of PCs merely reflects how successful the West has been in putting these machines into use as a common commodity.

Mr. Perle said that since the military had first called for foreign exchange, it would be the military that would have first claim on any imported computers...

Malcolm Miller, marketing director of the British computer company Amstrad Plc., which specializes in low-cost word processors and IBM-compatible computers...

Western manufacturers are eyeing what in theory is a potentially huge market. "Even a small part of it would be important," said Mr. Miller of Amstrad...

Whatever the expert system, whether it is run on a powerful microcomputer for real-time chemical plant control or a personal computer for a consultative accounting application...

The knowledge and experience of the human expert must be gathered and codified by a knowledge engineer. This knowledge base is then loaded into a computer as a set of rules...

By the end of the 1980s, according to DM Data, a research company, the largest single use of expert systems will be in the maintenance of complex equipment...

By 1990, Ovum, market researchers, predict that the West German market for expert systems will be £300 million (\$495 million) a year, the French market close to £280 million and the British market more than £250 million.

Ray Shaw, principal consultant at Systems Designers, in charge of its expert system project, says the consultative type of expert system and the real-time type will gradually go their different ways...

buy imported products. Therefore, any computers bought from the West are most likely to go straight to official institutions, factories and schools, where they are needed to support an announced campaign for mass computer literacy by the end of the century...

But Mr. Miller said that even if sales are initially to ministers and institutes, eventually, the technology will pervade downwards. The machines that millions of Westerners routinely use to balance their checking accounts, write reports, play space invaders or store their recipes are for the present beyond the dreams of most people in the Soviet Union...

For all the rhetoric about glasnost, the Soviet Union remains a closed society in which a Western-style revolution in information technology seems far-fetched. The Marxist-Leninist system is based on the tight and centralized control of all sources of information...

Mr. Goodman said the Soviet Union is far ahead of China in its application of computers, but it is acutely aware of its growing technology gap with the West. It is a dilemma to which there is as yet no answer...

On the other hand, they cannot afford not to.

Some people call it an eyecatcher...



...we call it the new Minolta EP 570 Z. Your first impression of the new EP570Z is brilliant performance, yet remarkably easy to use...

Turning Machines Into Experts

By Richard Sharpe and Margaret Coffey

LONDON — In every organization there is an expert, someone who, with formal or informal recognition, knows more about the business procedures, operating techniques and decisions than anyone else...

Until recently, computerized expert systems depended on such complex instructions and needed so much computing power to be effective that they were confined to the most urgent and most profitable applications, mostly military and geophysical.

Now a movement has started that, within a few years, could make expert systems running on personal computers as universal in use and as easy to manipulate as spreadsheets are today.

Two technical developments in the computing field are bringing the day of universal use of expert systems closer. First, there is the development of more powerful personal computers with more computer processing power and more storage capacity...

personal or more powerful computer. Users will then be able to buy that expert system, probably for a few hundred dollars, and consult the expert's base of knowledge, getting not only the decision of the expert but also the assumptions behind it.

One area that is making great strides is the application of expert systems to real-time plant control in such applications as the monitoring and control of chemical plants, food, pharmaceutical or other process industries. In Britain, a special club of companies has been formed by a software house, Systems Designers, to take the lessons of an earlier collaborative venture a step further.

Whatever the expert system, whether it is run on a powerful microcomputer for real-time chemical plant control or a personal computer for a consultative accounting application, the structure is much the same.

The knowledge and experience of the human expert must be gathered and codified by a knowledge engineer. This knowledge base is then loaded into a computer as a set of rules, the form of which is determined by the specific expert system-building package.

By the end of the 1980s, according to DM Data, a research company, the largest single use of expert systems will be in the maintenance of complex equipment, with 28 percent of applications; in the financial sector, with 22 percent, and in manufacturing capacity planning, with 17 percent.

of rules to infer from knowledge, but the need to decide in real time will make special demands on the technology.

To achieve the high rates of growth predicted for the market, expert-system development packages will have to come in two types: those tailored to real-time applications along the lines of Systems Designers' work and, at the other end of the scale, those made as cheap and easy to use as the spreadsheet.

A simple consultative expert system, for a personal computer, to help with personnel selection has been launched for £99 by PAL Software in Britain.

But IBM's Personal System/2, the company's second-generation of personal computers, gives the expert-systems development package vendor a firmer foundation, according to Peter Llewellyn Jones, chairman of Creative Logic. Creative has just launched the expert system development package, Leonardo. The entry-level Leonardo costs £150 and is powerful enough to build a small-to-medium-scale consultative expert system of 1,000 rules.

Logica, the British software house, has taken the advanced version of Leonardo and built it into a computer operations advice package that helps the users of large computers find out where the bottlenecks in performance are.

At both ends of the market the demand for expert systems will expand through one professional group after another. Some groups will write their own expert systems using packages like Leonardo, just as they tackled spreadsheets and personal computer databases. Others will turn to the software houses like Systems Designers and Logica and have a tailor-made system developed for them.

The most conservative prediction is that the expert system market will grow fivefold over the next five years in Western Europe.

RICHARD SHARPE and MARGARET COFFEY are London-based freelance journalists specializing in computers and technology.

Swedes Ca... employees' workday begins with the ride to corporate headquarters. By Erol G. Rampersad... ASTERAS — The Asa Pendin control station at Stockholm's largest railway station has added a new dimension to the office by bringing the office to the train... In on Platform 6 at 7:40 A.M. Asa Pendin, the Swedish railway's largest station, has added a new dimension to the office by bringing the office to the train... The ride to corporate headquarters... The ride to corporate headquarters... The ride to corporate headquarters...

Nixdorf... Most all of the big names in the industry works with Nixdorf. The reasons differ, but the underlying is the same. It is simply that Nixdorf Computer is a comprehensive and reliable software solutions provider. We are the leading suppliers of software solutions, including an integrated business system. Our financial accounting, stock...

**Technology Workplace**

# Swedes Catch the Office Express

Employees' workday begins with the ride to corporate headquarters.

By Errol G. Rampersad

**V**ASTERAS — The Asa Pendeln that pulls out of Stockholm's central railroad station on workdays has added a new dimension to commuting by bringing the office to commuters.

Clocking in on Platform 6 at 7:40 A.M., the office staff of Asa, Scandinavia's largest maker of heavy electrical equipment, take to their desks in what is the world's first and only railborne office. Their workday begins with the ride to corporate headquarters and their jobs in Västerås, a former Viking trading town 130 kilometers (80 miles) away.

The luxuriously appointed carriage, outfitted at a cost of 4 million Swedish kronor (\$6.7 million), can seat 40 passengers. It is equipped with 26 ergonomically designed work stations, a special conference room and a lounge, which is decorated with potter plants and contemporary prints.

The coach is owned by Asa and is the first private passenger train to run on the state-owned railroad network, Statens Järnvägar.

The work stations are equipped with telephones connected to a conventional telephone exchange, which in turn is coupled to a mobile telephone system. It provides access to any country in the world, as well as Scandinavia's ubiquitous cellular phones in cars and boats. Riders can use electric typewriters as well as personal computers, with which they can gain access to data bases at corporate headquarters in Västerås. Commuters, armed with their diskettes, are in touch with a specially linked computer throughout the ride.

The office-on-wheels was the brainchild of 34-year-old Ann Larsson, a member of Asa's business development and corporate planning division, herself a Stockholm-Västerås commuter. "It was a joke at first," she explained. "Then we thought, why not. It seemed crazy but it made sense."

Mrs. Larsson, who recalled her dread of having to drive from Stockholm to her offices in Västerås through the ice and snow during the long and dark winters, said the idea of a mobile office came to her after she switched to commuting. "Many of us who preferred to live in the capital were not



Swedish commuters get all the amenities of the office as the scenery goes by.

happy about the three hours we wasted every day traveling back and forth to Västerås," she recalled. "I felt a lot of valuable time and manpower was being wasted on commuting. I realized this time could better be used to benefit both employer and employees." She presented the concept of a mobile office to Percy Barnevik, president and chief executive officer of Asa, who was receptive to the idea.

The train also ferries visitors traveling from Stockholm and Västerås executives going to the capital for meetings and conferences. It travels back and forth six times a day.

Employees purchase a regular second-class roundtrip ticket, costing 160 kronor a day. Asa pays one-third and the rest is tax deductible. Half the time spent traveling — the trip to work — is deducted from the workday.

"Since Asa manufactures locomotives, commuter trains and freight cars and is also involved in a new Swedish high-speed train project, the mobile office gave the company a rare opportunity for promoting its products," said Peter Olofsson, a member of the corporate communications staff. Company officials said they think it is only a matter of time before the railborne office makes its debut in other industrialized countries.

Japanese companies are looking into the idea, and Tokyo television companies have

done documentaries on the Asa Pendeln run.

Olle Welin, engineering project leader for the commuter office, said that the Volkswagen division in Amsterdam had expressed an interest in a similar project. Volvo, which has just taken over the abandoned shipyards at Uddevalla in Sweden, was also looking into the pendeln idea, Mr. Welin said. He noted, too, that the Italians have approached Asa with a view to setting up something similar to ferry journalists between cities during the 1990 World Cup football championship.

"As a manufacturer of locomotive assemblies, it is somewhat exotic and, certainly, less costly for Asa to accept the idea of an office on rails," a commuting executive said. "Moreover, cooperation between private enterprise and the state-owned railways is much easier here in Sweden, where labor relations have always been harmonious."

"The railway people have been very enthusiastic and have cooperated in every way," Mrs. Larsson said.

So too has Televerket, the nationalized telephone company. There are 26 phones aboard and one can dial anywhere in the world.

The mobile office is run by a staff of four, working in two shifts, operating the switchboard and making sure things run smoothly. On a recent 7:40 run from Stockholm, Eva-

Lena Nilsson and Karolina Frielingsdorf went about their duties with customary efficiency, oblivious to the towering pines and sparkling lakes that flashed by. "We have gotten so used to our 'office' that we hardly ever miss the atmosphere of the conventional workplace," they said.

**A**SEA HOPES that its investment in the pendeln would help to attract the capital's university graduates to its offices in Västerås, which, with its 120,000 inhabitants, is a one-company — Asa — town. Stockholmers find it rather boring, since there are few amenities for nightlife.

Last year, Asa, founded in 1883, ranked among the world's 10 leading electrical and electronics enterprises, with operations conducted through 346 companies, with a work force of 71,000 employees. Approximately 70 percent of its sales are outside of Sweden. In a merger with Brown, Boveri & Co. of Baden, Switzerland, announced last month, Asa now becomes the largest in Europe, with a joint work force of 160,000.

Greeting the announcement of the merger on a recent ride, Mrs. Larsson laughed at the suggestion of a railborne office between Baden and Västerås.

**ERROL G. RAMPERSAD** is on the editorial staff of the *International Herald Tribune*.

# Fully Automated Factory Goes Beyond the Dream

By Beth Karlin

**W**ASHINGTON — For most international companies, the paperless factory remains a dream. Punch-pushing and paper-shuffling continue to inhibit productivity gains. But a handful of forward-looking companies are investing heavily to make automation a reality. They are computerizing and integrating everything from sales to manufacturing to shipping. And they are doing it on a worldwide basis. Early results are impressive.

At Tandem Computers, for example, productivity increased 340 percent and work-in-process throughput decreased from 19 weeks to less than two weeks as a result of extensive automation at its Watsonville, California, facility. Tandem's high level of office and manufacturing automation extends far beyond Watsonville to encompass — and unite via a sophisticated network — three domestic assembly plants and another in Neufahrn, West Germany, according to Jack Cundari, Watsonville plant manager.

Successes by Cupertino, California-based Tandem and other innovators are encouraging more companies to expand computer integrated manufacturing. Such firms as ICL of Britain, N.V. Philips of the Netherlands and Siemens of West Germany are following suit. Indeed, European spending for automation is growing at a faster rate than in the United States, according to Dataquest Inc., a San Jose, California, market research firm.

Europe's speedier growth is due at least in part to the fact that it is making up for a slower start. But the declining value of the dollar, and corresponding increase in the price of foreign-made products in the United States, also is contributing to the new enthusiasm for automation in Europe. The only real way to lower prices, without lowering profit margins, is to cut production costs.

"They've had to automate," says David Penning, director of Dataquest's manufacturing automation service. "And while they've been making real changes, we've just been fooling around with currency. Once again, we've shot ourselves in the foot."

Total European spending for automation, including computers, software and manufacturing systems, will more than double to \$7.1 billion this year, from \$3.3 billion in 1983, according to Dataquest. By 1991, Dataquest predicts, European automation investment will climb nearly 50 percent more to \$10.5 billion.

U.S. spending, meanwhile, will increase 78 percent to \$17.8 billion, from \$10 billion between 1982 and 1987. Dataquest forecasts, however, that by the end of the decade, U.S. spending for factory automation will start increasing at a faster rate. By 1991, Mr. Penning estimates, the U.S. market will expand to \$28.3 billion.

In terms of total world market for manufacturing automation equipment, Dataquest says, the United States was first in 1986, with 51.5 percent of factory revenue; Asia was second, with 20.8 percent, and Europe was a close third with 20.6 percent. In factory automation unit shipments for 1986, the United States led with 53.5 percent; Asia was second with 20.5 percent, and Europe was third, with 19.8 percent.

## How U.S. Systems Score Abroad

Foreign sales of American-made automated manufacturing equipment have grown from \$9 billion in 1982 to \$17 billion this year. By 1991, the market could exceed \$29 billion.

Destination	1982	1987*	1991*
United States	10	18	28
West Europe	3	7	10.5
Asia	4	7.5	14
All Other	1	2.5	5

\*Projections. Source: Dataquest

European demand for automation equipment has created profitable new markets for U.S. firms, particularly in computer-aided design and manufacturing (CAD/CAM). CAD/CAM is the essential first step in computer integrated manufacturing. The data generated by designers and engineers as they fashion products on a CAD system's video screen provide much of the information that is necessary to computerize the overall production planning effort. This includes manufacturing the tools, ordering the raw materials and scheduling the production runs.

"Exports [of CAD/CAM equipment] have grown at a tremendous pace," says Deborah Harris, an economist with the International Trade Commission. Foreign sales of U.S. products have skyrocketed from about \$243 million in 1980 to about \$1.6 billion in 1986, she said. U.S. CAD/CAM vendors dominate 70 percent of the West German market, for example, and 75 percent of the British market.

The benefits of computer integrated manufacturing are many, says Tandem's Mr. Cundari. Assembly and test operations at the computermaker's Austin facility, for instance, are entirely tracked and controlled without paper. Wands are used to read bar code labels affixed to subassemblies and other work in process. As a result, the computer records — and any worker who wants to know can instantly learn — where the work has been, where it is and where it is headed.

Via computer, Tandem officials can learn everything from the raw material to finished goods inventories at any of the other plants.

**BETH KARLIN** is a Washington-based journalist who contributes regularly to *Electronic Business* and other technical publications.

# Nixdorf. The common element in the world's great cars.



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Technology Developments

Companies Try to Cash In on New High-Tech Carbon

By Vivian Lewis

PARIS — Takeover bids, joint ventures, international acquisitions, know-how sales, are proliferating in the carbon business — but that is because carbon is becoming high-tech. British Petroleum has acquired Hitco of the United States, which makes carbon-carbon engine nozzles. BASF of West Germany has bought Celanese, a leading U.S. carbon fiber manufacturer. Du Pont has also bought into the business.

In civil aviation, carbon fibers are replacing light metals.

French composites joint venture has been set up with Ferro Corp. by Alstom. Pure carbon (graphite) filaments used to be used merely to make incandescent light bulbs. Now they are being stretched and spun out into fibers, sized, girded, textured and matted to make felt. They are woven alone or with plastics or metals to make cloth. They are coated, layered, soaked with resins, vacuum-cooked, dehydrogenated, polymerized, baked at ever higher temperatures — up to 3000 degrees Centigrade (3632 degrees Fahrenheit) — lined with other new materials like Kevlar or fiberglass or epoxy, sandwiched around foams, machined, molded and rolled in a host of new, labor-intensive processes to produce new carbon materials. Tailoring carbon fibers and carbon composites produces costly materials that are incredibly light and that have properties similar or better than those of metals in resisting heat, abrasion, pressure and chemicals. Pure carbon has a "miracle" feature, since its friction coefficient rises with temperature, making it ideal for brakes. Production is semi-artisanal, measured in hundreds of tons, whereas most chemicals are produced in millions of tons, and prices are high, ranging from \$1.50 to \$15 per pound for composites used in the sports industry, and \$20 to \$220 per pound for aerospace composites and carbon fiber. This compares with about \$4.50 per pound for special steels. Given their high price, carbon fiber and carbon-carbon composite materials can replace metals where losing weight is worth paying for: mostly airplanes and missiles, but also sports equipment, such as golf club shafts, arrows, bicycles and tennis racquets. For airplanes, saving one pound in construction is worth \$250 to \$500 during operating life. As a result, the use of carbon fibers in planes has mushroomed. In civil aviation, carbon fibers are increasingly replacing light metals like magnesium, despite their cost, because they require one-tenth the density for comparable performance.

In current Airbus production, composites account for 18 percent of the total weight of the planes — the A320, A330-34 and ATR models. Two years ago, they accounted for only 9 percent. Industry sources estimate that composites will account for 30 to 40 percent of the total for the next civil aircraft generation — fuselage, brakes, wings, ailerons, tail, jet housings, ducts, landing gear housings. In military aviation, composites are used more widely. For example, in the Dassault Rafale model, composites account for 24 percent of the weight, compared to only 7 percent in the Mirage 2000. Every Rafale in current production uses 2,083 pounds of composites. In the United States, aerospace accounts for 60 percent of the carbon fiber market, and in Europe for 55 percent. Only in the Far East are sporting goods the major market. The current market for carbon fibers is about 4,400 tons annually — 2,200 in the United States, 1,250 in Japan, 750 in Europe. By 1990, the market is expected to reach 6,800 tons; by 1995, up to 11,200. Growth is expected to be fastest in Europe and in countries not included in the geographical breakdown, like China, Israel, Brazil and South Africa — from a lower base. By 1995, America's will be up 150 percent and Europe's will nearly quadruple. Carbon fibers were invented in Europe but the inventor, British, has lost rank in developing it. The development of carbon fibers was started in the early 1960s by the RAE research center in Farnborough, England, and was brought into commercial use by the Hysol-Grafil joint venture of the British chemical firm Courtauld and Dexter Hysol, a U.S.-based company in Pittsburg, California. Hysol-Grafil is still the leading European producer, with a rated capacity of 350 tons a year at Coventry and a further 300 tons produced at Sacramento, California. In addition it has sold licenses to producers from Shanghai and Finland to South America. It also dominates the production of the resin used to make the high-tech version of carbon fiber, called Pan (for poly-acrylo-nitrile). There also is a lower grade felt-like version, called pitch, which is less pure, cheaper and more widely used. But in the world carbon fiber league, the top producers are Japanese: Toray, at 1,500 tons, with a further 360 tons produced under license by Amoco in the United States and 300 tons by a joint venture in France; Toho Rayon at 1,390 tons, with a further 350 tons being brought into production by Enka in the Netherlands, or American, starting with the Hercules plant in Bascomb, Utah, at 1,050 tons a year, and followed by the Celanese-BASF plant at Rockhill, South Carolina, at 450 tons a year. In an attempt to catch up in carbon fibers, the French government in 1981 supported the establishment of two joint ventures, one with Hercules by Pechiney, and the other with Toray by Elf. But then it became clear that the market was not doubling every year and that two factories competing with each other would be catastrophic. Since Elf, an oil company, is government controlled, and Pechiney is nationalized, the government could stitch together a complicated three-way joint venture, and Hercules was persuaded to pull out in 1984. Soficar still must buy both the carbon fiber and the knowhow to process it from Toray.

By scrupulously following Japanese production methods, Soficar three years later is producing material up to Japanese levels. Last year Boeing qualified output from the Soficar plant for use on its planes, and in June, qualification was given by Aerospatiale and Dassault in France. Soficar is still working on gaining qualifications from MBB of West Germany, which builds composite parts for the Airbus. The state got involved in the technology purchases to increase the French role in making composites for the military. But now that access to the material is greater, the French are working on new uses for carbon-carbon composites. For example, Carbone Industrie, a joint venture of Alstom and Messier-Hispano-Bugatti, making carbon-carbon aviation and racing-car brake systems, is about to sign a contract to provide braking systems for a standard luxury car with an as-yet unnamed French producer. Officials of the firm calculate that saving a pound in producing a car is worth \$125 to \$250 over its life. Alstom is also working on a braking system for the newer, faster version of the TGV train, which will go at up to 350 kilometers (217 miles) an hour, compared to 250 to 270 kilometers for the current Paris-Lyons run.

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Fiber carbons can be used for airplanes — or bicycles.

In the beginning, fabled designer Coco Chanel orchestrated the development of each fragrance that bore her name and personally inspected every stitch of her innovative fashions shown in her Paris rue Cambon salon. The House of CHANEL is now a world-renowned institution, but its commitment to quality, service and the small but vital detail remains unequalled. CHANEL still depends on personal craftsmanship to produce many of its famous products. But now, those processes that can be entrusted to modern methods are entrusted to Unisys. "It's a perfect marriage of high tech and high fashion," says Prakash Trivedi.

His Unisys team worked with CHANEL to develop an on-line inventory and manufacturing system that enables The House of CHANEL to monitor production standards and to keep track of goods that are shipped to stores and CHANEL Boutiques across the country. "Efficiency is the key word." Manufacturing specifications for the company's famous perfumes, including CHANEL N° 5, are stored in Unisys microcomputers in Piscataway, N.J. The microcomputers also are used to evaluate perfume samples as they come off the assembly line. A mainframe system then monitors the manufacturing and distribution of products. This manufacturing data is immediately available to company executives, along with information from micro-computers in CHANEL Boutiques across the country, providing an up-to-the-minute inventory database. It used to take three to four days for this information to reach executive desks. "By having the data to make better, more-informed decisions, profits have increased while the high level of product excellence and customer service has been maintained," says Trivedi. CHANEL has long been familiar with the sweet smell of success. "And now with Unisys, CHANEL has found that computers are very much in style." Unisys and manufacturing. The power of 2.



"High tech comes to high fashion."

Prakash Trivedi, Branch Sales Manager, Unisys.

UNISYS The power of 2

Ozone Pact in Doubt

Continued from page 7

reached in Geneva in April to reduce CFC production and consumption. The pact would freeze production at 1986 levels beginning in 1990, with a 50 percent decrease over the next five years. "I think there is a good chance of getting an agreement signed," Daniel J. Dudek, senior economist of the nonprofit Environmental Defense Fund of New York City, had said earlier. Mr. Dudek and other environmental officials acknowledge that there is some opposition, both from industrial producers and users as well as from underdeveloped countries. These countries may be given more time to deal with the effects of drastically reduced CFC production. The British and German chemical industries question the need for curbs and fear that they will unfairly benefit the U.S. chemical giant E.I. du Pont de Nemours and Co. Du Pont has recently stepped up research on CFC substitutes and says that it can provide ecologically sound alternatives on a commercial basis in five years. The European companies say it will take them 10 to 15 years to catch up. Until recently, the United States had galvanized efforts to reach an accord. But in May, the U.S. interior secretary, Donald P. Hodel, proposed an alternate "personal protection" program against ultraviolet radiation using sunglasses, hats and sun-screening lotions. Mr. Hodel said he believed an accord might counteract President

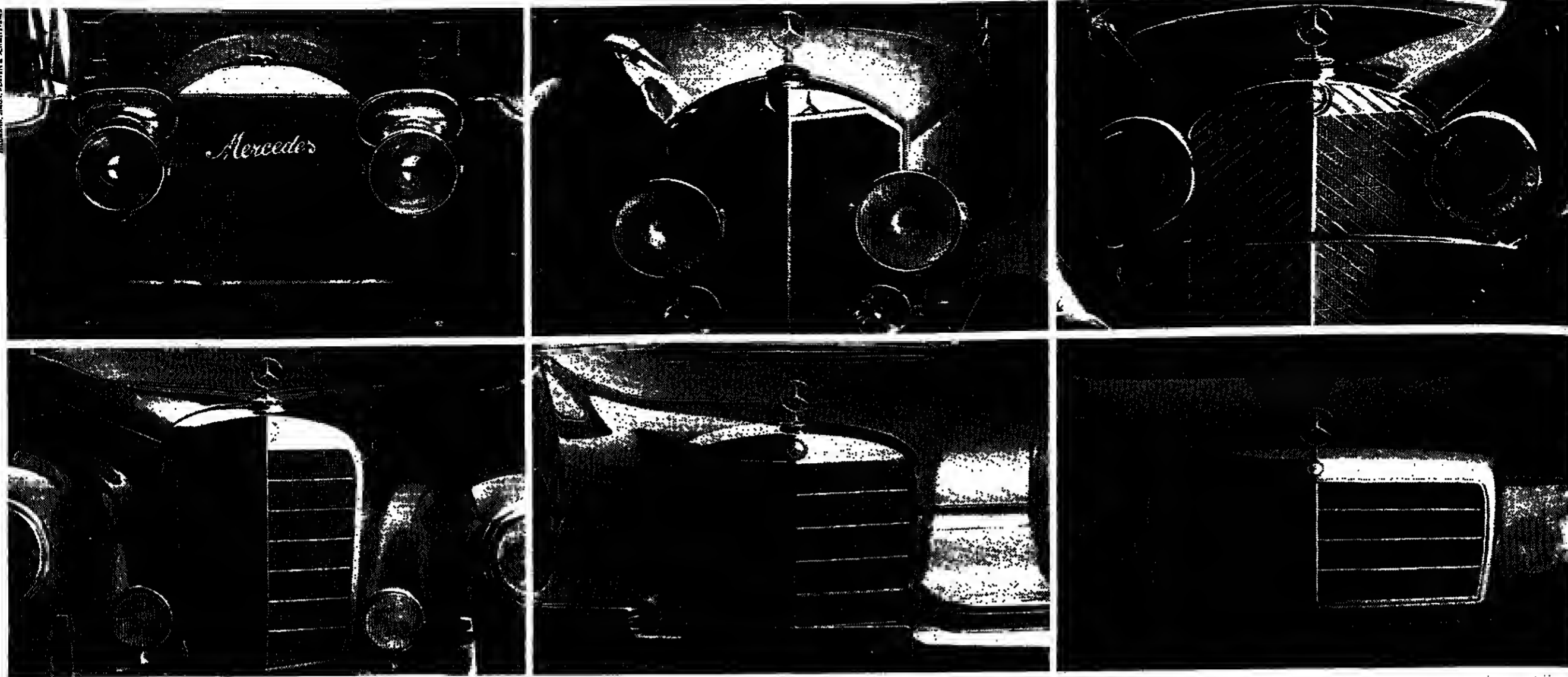
Ronald Reagan's philosophy of reducing government regulation. These suggestions, however, provoked amusement and even scorn from environmentalists. "Hodel actually did a great service to the issue by pointing up the absurdity of a 'no action' alternative," Mr. Dudek said. "When they began to check the cost of sunglasses and sun screens for people, they began figuring on \$50 to \$60 a person. And on that basis nationwide, you can get into some real fancy numbers." Scientific analysis and international diplomacy appear to be ahead of sunglasses and sun screens in the battle against ozone depletion, Mr. Dudek and other environmentalists say. Despite Mr. Hodel's comments, the U.S. State Department and the Environmental Protection Agency remain committed to an accord, with the support of large industrial concerns. Meanwhile, the European Community, under pressure from West Germany, the Netherlands and Denmark, has recently endorsed a tighter schedule of reductions in CFCs. At the same time, a move toward accommodating Third World concerns may also ease the path to an accord. Limited exemptions could ease Third World fears that drastic reductions in CFCs could harm their fledgling chemical, consumer, computer and refrigeration sectors, environmental officials say. THOMAS NETTER is a journalist based in Geneva.

Scramble

Scramble text containing various words and phrases, partially obscured and difficult to read.

Research Effort

Research Effort text, partially obscured and difficult to read.



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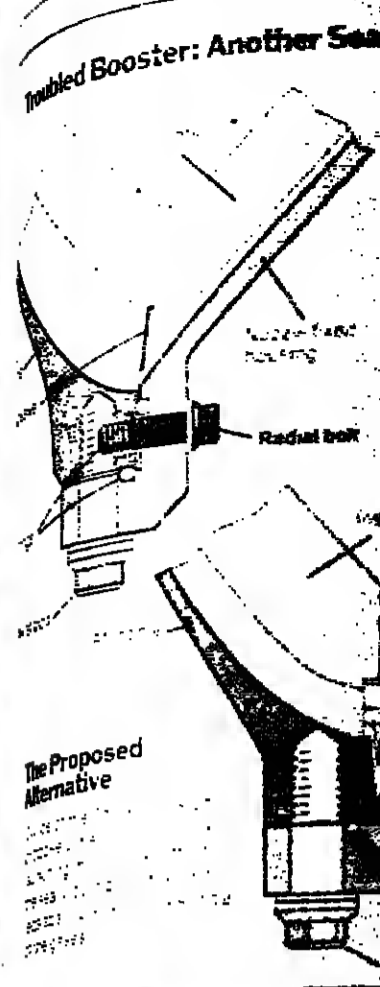
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## Buttle Safety

metal-to-metal bolts has been effective, even rubber seal was for extra protection it will soon demonstrate it worked as Roger we are testing.

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SCIENCE

# The Surgical Saga of the Siamese Twins

By Jane E. Brody  
New York Times Service

**T**HE historic surgery Saturday and Sunday that successfully separated 7-month-old Siamese twins joined at the head actually began in West Germany five months ago. Last spring, a team of physicians from Johns Hopkins Hospital in Baltimore visited the infants and devised a unique operative plan that they thought could separate them without causing lasting brain damage.



Dr. Mark Rogers with the dolls used to rehearse surgery.

was done in 56 minutes and the other in 63," Dr. Carson said.

Then came an even scarier moment. Once the babies' hearts were restarted, they bled profusely from all the tiny blood vessels in the brain that had been severed during the surgery. First after pituitary gland, nearly exhausting the supplies; participants in and out of the operating room volunteered more.

At the same time, the babies' surgically traumatized brains began to swell dramatically.

So it was decided to end the surgery as soon as possible, rather than pursue the original plan to fit the babies immediately with custom-designed metallic mesh skull coverings.

According to Dr. Craig Dufresne, the plastic surgeon who had designed the coverings using a three-dimensional model generated by a Comax computer, a second operation to create a cosmetically acceptable skull will be done at a later date, assuming the babies continue to recover normally. Once in place, the babies' skull bones will grow into and around the mesh, which will never require removal, the plastic surgeon said.

Before the separation surgery could be undertaken, a section of the hospital needed to be rewired. "We tried to anticipate everything," Dr. Rogers explained.

"Like what would happen if there were a power failure during the surgery. With all the machines we were using, we could easily have overtaxed the operating room's electric system."

But throughout the planning, the central concern remained the babies' neurological status. "We decided in advance not to proceed unless we thought we could separate them without compromising the neurological function of either baby," Dr. Rogers said. Until the infants' brains were actually exposed during the operation, the surgeons could not be certain that parts of critical brain tissue, such as the vision center, were separate. Fortunately, they turned out to share only a main drainage system, called the sigmoid superior sinus, and a critically important vein.

Dottie Lappe, the acting head nurse of the pediatric intensive care unit, who cared for the Binder babies before their surgery as well as after, described them as "happy, smiling, playful infants who laughed and cried like other babies." Except for their immobility, she said, they were at the right developmental stage for their age.

"Everything in the surgery went as planned and as well as we could have hoped for," Dr. Carson said. "The rest is up to God."

Dr. Ben Carson, the pediatric neurosurgeon who had surgically divided the shared brain tissue. But he and his colleagues had been able to stop the extensive bleeding that had complicated the end of the difficult surgery.

To try to prevent permanent brain damage, a complication of previous attempts to separate Siamese twins joined at the head, the Johns Hopkins team had combined

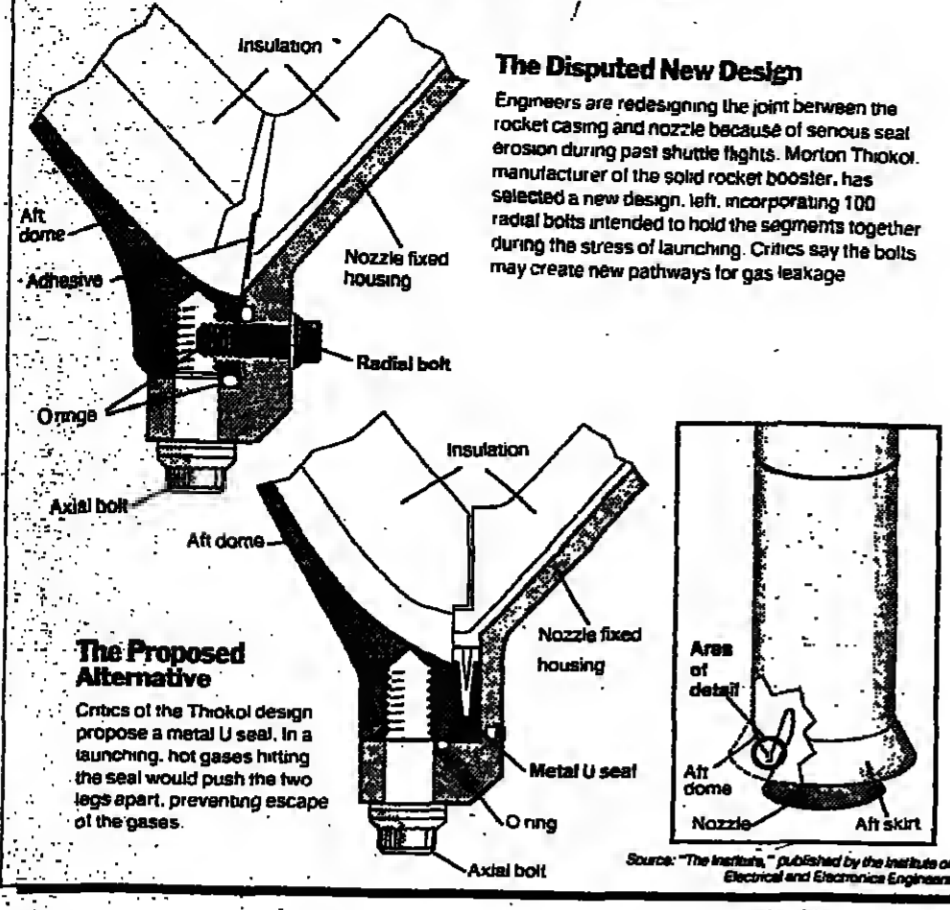
a series of routine but advanced medical maneuvers that put the brain temporarily on hold. The babies were placed on heart-lung machines and cooled to reduce brain function to near-zero. At the critical moment, when Dr. Carson had to divide the shared brain cavity and drainage vein, the cardiac surgeons, Dr. Bruce Reitz and Dr. Duke E. Cameron, drained all the blood from the babies' bodies and stopped their hearts.

Dr. Carson and Dr. Donlin Long, the chief of neurosurgery, had one hour to accomplish final separation, reconstruct the divided brain cavities and veins and restart the hearts and blood flow. Longer than that and the oxygen deficit could result in permanent brain damage, Dr. Cameron said.

"As we got to 45 minutes, there was a lot of tension in the operating room. But we made it. One baby

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## Troubled Booster: Another Seam Under Scrutiny



**The Disputed New Design**  
Engineers are redesigning the joint between the rocket casing and nozzle because of serious seal erosion during past shuttle flights. Morton Thiokol, manufacturer of the solid rocket booster, has selected a new design, left, incorporating 100 radial bolts intended to hold the segments together during the stress of launching. Critics say the bolts may create new pathways for gas leakage.

### The Proposed Alternative

Critics of the Thiokol design propose a metal U seal. In a launching, hot gases hitting the seal would push the two legs apart, preventing escape of the gases.

Source: "The Insulator," published by the Institute of Electrical and Electronics Engineers.

## Shuttle Safety Debate Persists

By David E. Sanger  
New York Times Service

**E**VEN as engineers dissect the space shuttle booster rocket fired in Utah recently, debate continues over one element of the rocket's redesign that some engineers suggest poses as many hazards as it eliminates.

The debate does not center on the joints that failed in the Challenger accident, but on another crucial seam, at the aft end of the rocket where the nozzle is attached. In shuttle flights before the Jan. 28, 1986, accident, the awkwardly shaped "nozzle-to-case" joint was the site of some of the most serious in-flight erosion of safety seals. Revamping the nozzle joint, which cannot be seen from outside the rocket, has been one of the stickiest problems facing Morton Thiokol Inc., the manufacturer.

A new design, incorporating an extra O-ring, 100 bolts to hold the joint together, and other changes, has been adopted by Thiokol with the endorsement of Allan J. McDonald, one of the Thiokol engineers who warned against launching the Challenger. But the new design has been criticized by Roger Boisjoly, a former Thiokol engineer who also argued against the ill-fated Challenger flight.

metal-to-metal seal formed by the bolts has been tested and shown to be effective, even without the Viton rubber seal around the bolt heads for extra protection. "We are confident it will work, and that tests can demonstrate it works. But we are as worried as Roger is, so that is why we are testing alternatives."

Members of the National Research Council say they believe Mr. Boisjoly's fears about the Thiokol design and its bolts may be exaggerated, because bolts like that have proved successful elsewhere in the shuttle. Nonetheless, they acknowledge that the bolts could bend the joint out of shape, and that bolt holes could weaken the overall steel case structure.

That's why we conduct tests," a member of the panel said. "Of course," he added, "the booster was tested extensively before the shuttle accident, too. And look what happened."

## IN BRIEF

### Possible Key Found to Malaria Deaths

**WASHINGTON (AP)** — Scientists have discovered that a natural body protein is likely a major cause of the deadliest complication of malaria, a finding that suggests that blocking the chemical's action might save hundreds of thousands of lives each year.

Studies indicate a protein called tumor necrosis factor (TNF) or cachectin is an essential element in highly fatal cerebral malaria, said researchers with the World Health Organization and the University of Geneva in Switzerland. Blocking the protein's action with antibodies or other agents might be a new way to treat the most fatal complication of malaria, according to a report in the journal *Science*. Estimates are that cerebral complications account for more than half of all malaria deaths even though the condition develops in less than 1 percent of cases overall. There are an estimated 100 million estimated new cases of malaria worldwide each year, with one million resulting in death.

### Birth Defect-Alcohol Links Studied

**CHICAGO (UPI)** — Pregnant women who have one or two drinks a day do not put their babies at greater risk for most birth defects but even small amounts of alcohol may be linked to one malformation, according to scientists of the National Institute of Child Health and Development.

They analyzed the drinking habits and pregnancy outcomes of 32,870 women and found that those who had two drinks or less a day had the same risk of birth defects overall as women who did not drink. Binge drinking, not drinking during the week but drinking seven or eight drinks on a weekend, was cited as most dangerous, with effects including spontaneous abortions, still births, low birth weights and other risks.

"We did find a direct relationship between the amount of drinking — even in light amounts — and an increased risk of urogenital malformations," said Dr. James Mills, an institute epidemiologist. "My recommendation to women would still be don't drink when you're pregnant. We still clearly do not know enough about this."

### Starfish Used in Male Pill Research

**DURHAM, New Hampshire (AP)** — A University of New Hampshire zoologist is using the common northern starfish in research aimed at producing a contraceptive pill for human males.

Charles Walker is studying sperm production by starfish because, unlike human males, it produces sperm only once a year. He is trying to find the chemical trigger that tells the cells when to divide and form sperm. He believes that a similar process occurs in humans and a pill to block a chemical trigger should have fewer side effects than hormones such as steroids.

The starfish has the advantage of having two organs in each of its five legs where sperm are produced, making it a useful lab specimen. Mr. Walker said the starfish also is in a more direct evolutionary line with humans than the fruit fly and other animals used in similar research.

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NYSE Most Actives table with columns: Vol, High, Low, Last, Chg.

Market Sales table with columns: NYSE 3 p.m. volume, NYSE adv. volume, Amex 2 p.m. volume, Amex adv. volume, Prev. OTC 2 p.m. volume.

NYSE Index table with columns: High, Previous, Low, Today's P.M.

Wednesday's NYSE Closing Via The Associated Press

AMEX Diary table with columns: Class, Prev., Today's P.M.

NASDAQ Index table with columns: Prev, Today, Week, Year

AMEX Most Actives table with columns: Vol, High, Low, Last, Chg.

Dow Jones Bond Averages table with columns: Bond, Prev., Today's P.M.

NYSE Diary table with columns: Class, Prev., Today's P.M.

Odd-Lot Trading in N.Y. table with columns: Buy, Sell, % of 100

Dow Jones Averages table with columns: Dow, High, Low, Last, Chg.

Standard & Poor's Index table with columns: High, Low, Last, Chg.

Previous NASDAQ Diary table with columns: Class, Prev., Today's P.M.

AMEX Stock Index table with columns: High, Previous, Low, Today's P.M.

Tables include the nationwide prices up to the closing on Wall Street and do not reflect late trades elsewhere.

N.Y. Stock Prices Move Higher

NEW YORK — Prices on the New York Stock Exchange edged higher Wednesday in volatile trading, overcoming concern about higher U.S. interest rates and the dollar's stability.

The Dow Jones industrial average rose 4.15 points to close at 2,549.27, according to preliminary figures, after declining 16.26 points on Tuesday. Two hours before the close the average was up 12 points.

Advances just edged declines, and volume fell to 163.70 million shares from 242.88 million on Tuesday.

Trading was choppy through the morning but a midday firming trend in bond prices supported modest afternoon gains for stocks. Traders said investors hunted for bargains, especially among blue-chip issues.

Even so, they said buying was kept in check by morning bond market weakness and by nervousness about the U.S. merchandise trade figures due on Friday. Economists are expecting the figures will show a deficit of about \$15 billion to \$16 billion.

Bond prices have fallen sharply in recent weeks on fears that the Federal Reserve Board is only beginning to push interest rates higher. Investors worry that the July trade deficit will be steep enough to push the dollar into another decline and the Fed into another tightening move.

The Fed on Friday boosted its influential discount rate, charged on loans to financial institutions, to 6 percent from 5.5 percent.

At 3 P.M., Ames Department Stores was the most active NYSE-listed issue, falling 3/4 to 18 1/2. Late Tuesday, the company reported a sharp drop in second-quarter earnings.

Among blue-chips, AT&T, General Electric, USX, American Express and Coca-Cola were ahead. IBM, Eastman Kodak, Union Carbide and Philip Morris were lower.

Digital Equipment was off a bit. At its trade show in Boston, it introduced two new computers in its Microvax computer family and two new computer work stations.

Among other computer issues, Cray Research was off slightly. Unisys, Compaq Computer and Hewlett-Packard were steady.

Pannill Knitting was up sharply. Pannill said that it hired Merrill Lynch Capital Markets to evaluate the possible sale of the company.

Airline issues strengthened on news that AMR, parent of American Airlines, plans to boost fares in a class of one-way discount fares. Other carriers said they would match the hikes. AMR and Delta were up. Texas Air, training on the American Stock Exchange, was flat.

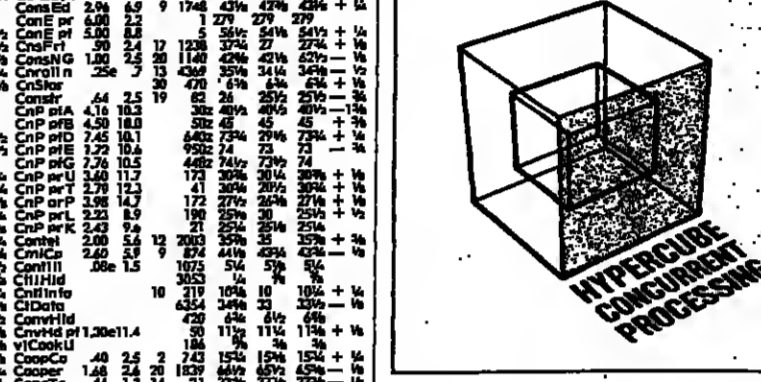
Newmont Mining was up. It rose 1 1/2 Tuesday when a group led by T. Boone Pickens began a cash tender offer for 28 million shares of Newmont at \$95 a share.

Delmed led the Amex actives, advancing. In over-the-counter trading, Walbro moved higher. UIS, a private New York firm, began a \$27.25-a-share tender offer for 2.1 million Walbro shares. Walbro, a maker of carburetors and fuel pumps, has 3.5 million shares outstanding.

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Similar results came from a survey of 100 British executives. It found that 60% of British executives have been with one company for more than 20 years. Only 10% of American executives have been with one company for more than 20 years.

See LIFERS, Page 25

Large table of stock prices with columns: 12 Month High, Low, Stock, Div, Yld, PE, % Chg, High, Low, Close, Open, Chg.

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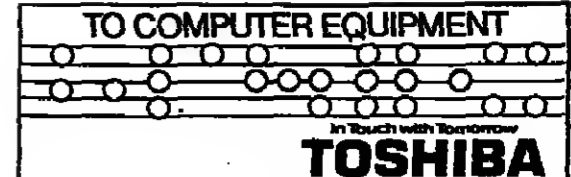
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Advertisement for 'Currency Rates' and 'Interest Rates'. Includes tables of exchange rates and interest rates.





THURSDAY, SEPTEMBER 10, 1987

INTERNATIONAL MANAGER

Company 'Lifers' Losing Their Maximum Security

By SHERRY BUCHANAN International Herald Tribune

LONDON — To be a one-company employee, the "womb to tomb" type, was once the safest and, often, the most rewarding way to live one's working life.

If executives lose motivation, it is the company's fault, one manager says.

TO SPUR these executives, these companies rely mainly on lateral moves within their huge enterprises. One personnel officer at Siemens called it the irony of having his "own internal labor market."

See LIFEERS, Page 19

Does GATT Have a Future?

As U.S. Fights to Revive Free Trade Code, Many Say Reality Has Killed It

By Susan F. Rasley New York Times Service

WASHINGTON — Forty-six years ago last month, on a warship in the North Atlantic, Franklin D. Roosevelt and Winston Churchill drew up a statement of eight common principles on which they based their hopes for mankind after World War II.

Protectionism is fiercer than ever. The fastest-growing markets are in Asia, not the West, and trade barriers are often cultural. Under such circumstances, a code based on Anglo-American sensibilities may seem an anachronism.



Roosevelt and Churchill meet aboard the USS Augusta in 1941, setting the stage for a flood of post-war stories.

economic conflict between the United States and Japan, is even more blunt: "I think the GATT is dead. What we are doing now is fighting over its carcass," he said.

Four key principles underlie the GATT agreement: Trade without discrimination among all member countries; reliance on tariffs rather than import quotas or other import barriers to protect domestic industries when necessary; binding tariff concessions that cannot be rescinded without compensation to affected countries, and the resolution of trade disputes through consultation, conciliation and GATT settlement procedures.

Not all GATT critics are as harsh as Mr. Choate and Mr. Prestowitz. But even GATT supporters who say that the system is worth fighting to modify and preserve agree that it has fallen short on all four counts.

"The more complex trade has become, the more sophisticated the impediments have become, and, regrettably, GATT's own processes have not kept up," said Clayton K. Yeutter, the U.S. trade representative, who is a supporter of GATT.

In recent years, the failing that has received most attention is the dispute-settlement mechanism, a protracted, cumbersome process that conjures up images of the 19th-century British chancery courts piloted by Charles Dickens in his novel "Bleak House."

Consider, for example, the celebrated pasta wars. American pasta makers complained in 1981 that European pasta makers were gaining an increasing share of the U.S. market because of subsidies from the European Community that violated GATT rules.

See GATT, Page 21

Daimler to Seek A 5% Stake in France's Matra

By Ferdinand Proetzman International Herald Tribune

FRANKFURT — Daimler-Benz AG, the West German automaker, said Wednesday that it would try to acquire a 5 percent stake in the French electronics and defense conglomerate, Matra SA, from the French government.

The government, which nationalized Matra in 1981, has said that it plans to sell its 51 percent stake in the company, but a spokesman said Wednesday that he could not comment on the Daimler proposal until he had actually seen it.

It was unclear what a 5 percent stake in Matra would cost. Meanwhile, in Tokyo, Mitsubishi Motors Corp. said it would set up a joint venture with Daimler in Japan to market Mercedes-Benz automobiles. It also said the companies are studying the feasibility of joint-production of Mitsubishi trucks in Europe and possible co-development of a light truck.

A Daimler-Mitsubishi link would fit with Mr. Reuter's assessment of the global automotive market. Mitsubishi, which is partly owned by Chrysler Corp., said the joint sales company would complement the existing Mercedes sales network in Japan, and that some Mitsubishi dealers would sell Mercedes on a dual franchise basis with the Japanese automaker.

Mitsubishi said the companies are considering producing its Delica trucks in Europe, with Daimler's assembly plants in Victoria and Barcelona, Spain as possible locations.

"This business tie-up enables Mitsubishi to further complement and broaden its product lineup in Japan," the company said. It said the aim of the joint European production was "to secure a foothold as a production site in Europe."

France Clears Capel Bid To Buy Paris Brokerage

PARIS — James Capel & Co., the London-based stock brokerage, has received permission from the French Treasury to buy a Paris brokerage, Dufour-Koller-Lacarrière SA, a Capel spokesman said Wednesday.

Capel, a unit of Hongkong & Shanghai Banking Corp., is the first firm to take advantage of proposals to allow eventual full ownership by foreign companies. It did not say how much it paid for the Dufour stake.

Separately, a spokesman for the Paris Stockbrokers' Association said that the French state-owned bank, CREDIT National, had received permission to buy a 51 percent stake in Paris stockbroker Dupont Denant SA.

He said both the association and the French Treasury had approved the move. No financial details were immediately available.

Banking sources here and in London said more announcements were likely from domestic and overseas institutions in the next weeks in what many have dubbed "Le Big Bang," a takeoff on the London stock market's wide-ranging changes last October.

Roger Hornett, head of research at James Capel, said the group plans to take a 50 percent stake in Dufour on Jan. 1, increasing this to 49 percent at the start of 1989 and to 100 percent in 1990.

Currency Rates

Table with columns for Currency, Bid, Ask, and Date (Sept 9). Lists rates for various currencies including US Dollar, British Pound, and Japanese Yen.

Other Dollar Values

Table showing dollar values for various currencies like Australian Dollar, Canadian Dollar, etc.

Forward Rates

Table showing forward rates for various currencies and time periods.

Interest Rates

Table showing interest rates for various deposit types and terms.

Key Money Rates

Table showing key money rates for different categories.

U.S. Money Market

Table showing U.S. money market rates for various instruments.

Asian Dollar Deposits

Table showing Asian dollar deposit rates for different currencies.

Gold

Table showing gold prices for various locations and types.

British Telecom Chairman Resigns, Profit Rises

By Warren Getler International Herald Tribune

LONDON — Sir George Jefferson, chairman of British Telecom PLC, announced Wednesday that he would resign from the newly privatized utility at the end of the month.

His resignation comes at a shareholders' meeting in which British Telecom reported a better-than-expected 12 percent gain in pretax profit for its first quarter ended June 30.

The resignation also comes amid a torrent of complaints from customers about the service provided by the British telephone company. Sir George suggested that the criticism was unrelated to his decision to step down.

U.S. Rescues First City Bank Of Texas in Major Bailout

WASHINGTON — The Federal Deposit Insurance Corp. announced Wednesday a bailout package valued at nearly \$1 billion to rescue First City Bank Corp. of Texas.

Weekly net asset value

Table showing weekly net asset values for Tokyo Pacific Holdings N.V. and other funds.

U.S. Money Market

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Wednesdays NISE Closing

Tables include the nationwide prices up to the closing on Wall Street and do not reflect late trades elsewhere.

Table with columns: 12 Month High/Low, Div. Yld. PE, 52 High/Low, Close, Chg. Ctr. Ctr. Lists various stocks like AMER, AMER, AMER, etc.

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INTERNATIONAL FUNDS (Quotations Supplied by Funds Listed) 9th Sept. 1987

Net asset value quotations are supplied by the Funds listed with the exception of some quoted below issue price. The most recent symbols indicate frequency of quotations: (d)-daily; (w)-weekly; (b)-bi-monthly; (r)-quarterly; (t)-trimesterly.

Large table listing various international funds with columns for fund name, currency, and other details. Includes sections for ALMAGRO GROUP, TRADED CURRENCY FUND, and Other Funds.

Large advertisement for 'Call Your Free Number' and 'The International Herald Tribune' with contact information and subscription details.

BUSINESS ROUNDUP

LVMH Acquires Cognac Hine

PARIS — The luxury goods company LVMH Moët Hennessy Louis Vuitton, with a product line ranging from champagne to suits...

June, LVMH and Guinness, the Anglo-Irish brewing company, decided to merge their international distribution networks.

June merger that included the champagne houses Moët & Chandon, Dom Perignon and Veuve Clicquot as well as Hennessy brandy, Christian Dior perfumes and Louis Vuitton luggage. It expects annual revenue of about 13 billion francs.

P&O Pretax Profit Soars 45% With Help From Acquisitions

LONDON — The Peninsular & Oriental Steam Navigation Co. said Wednesday that pretax profit in the first half jumped 45 percent to \$101.1 million (\$166 million) from \$69.8 million a year earlier...

P&O said its half-year figures included the first contribution from European Ferries Group PLC, acquired last year. Progress had been made in integrating this company's ferry, port and property operations into the group, it said.

Recent changes in France's luxury goods industries include Yves Saint-Laurent's sale in July of Charles of the Ritz perfumes to Revlon Inc. of the United States.

Half-year net profit rose 47 percent to \$71.8 million from \$48.8 million, while revenue surged 66 percent to £1.20 billion from \$721.3 million.

P&O also owns Townsend Thoresen, the company whose Herald of Free Enterprise sank off the Belgian coast in March, killing about 200 people. It said that the tragedy had "cast a long shadow over all of us and will never be forgotten."

Guinness said that it would retain an association with Hine as existing distribution contracts are to continue and, in addition, it has been appointed the exclusive distributor for Hine products in the duty-free market worldwide, except where distribution is already undertaken by a third party.

Nokia to Buy Stake in Horda

HELSINKI — Finland's Nokia Group said it agreed to buy a majority stake in Sweden's Horda AB, which makes technically advanced rubber products.

Newmont Asks Shareholders To Defer Sales to Pickens

NEW YORK — Newmont Mining Corp. advised its shareholders Wednesday not to tender their stock to an investor group led by I. Boone Pickens until the gold and energy company made a recommendation on the \$95-a-share buyout plan.

each. Its payment for the 90 percent it does not now own would be about \$5.7 billion. "The board of directors encourages you to defer your decision whether to accept or reject the offer until you have had the benefit of and reflected on the board's recommendations," Mr. Parker said in a letter to shareholders.

Canon's Results to Exceed '87 Estimate, Sources Say

TOKYO — Canon Inc.'s parent company profit is likely to reach 20 billion yen (\$141.3 million) in the year ending Dec. 31 if the yen-dollar exchange rate remains at its present level, company sources said Wednesday.

Bankers Trust Prepares to Issue New Stock

By Robert A. Bennett New York Times Service NEW YORK — A battle for stock market investors by the biggest U.S. banks has heated up with an announcement by Bankers Trust New York Corp. that it will soon issue \$250 million in stock.

The moves "are ill advised and ill timed," said John B. Neff, portfolio manager for the Windsor Fund, which owns almost 6 million shares of Citicorp and almost 4 million shares of Bankers Trust.

Because Bankers Trust is in the strongest financial and earnings position, analysts think it can go to market with less of a sales effort than Citicorp or Manufacturers Hanover will need.

LIFERS: Less Job Security

(Continued from first finance page) Motor Co. executive who, late in his career, turned Chrysler Corp. around as chairman.

Floating-Rate Notes

Table with columns: Issuer/Note, Coupon, Maturity, Bid, Asked. Lists various floating rate notes from issuers like Citicorp, Bankers Trust, etc.

Deutsche Marks

Table with columns: Issuer/Note, Coupon, Maturity, Bid, Asked. Lists Deutsche Mark notes from issuers like Citicorp, Bankers Trust, etc.

Japanese Yen

Table with columns: Issuer/Note, Coupon, Maturity, Bid, Asked. Lists Japanese Yen notes from issuers like Citicorp, Bankers Trust, etc.

Pounds Sterling

Table with columns: Issuer/Note, Coupon, Maturity, Bid, Asked. Lists Pounds Sterling notes from issuers like Citicorp, Bankers Trust, etc.

Call Your Toll-Free Number FOR THE INTERNATIONAL HERALD TRIBUNE INSTANT SUBSCRIBER SERVICE

INTERNATIONAL POSITIONS

KLA Sales Director of Marketing (International) We invented an industry. Imagine what we can do for your career.

PRESIDENT THE AMERICAN COLLEGE IN PARIS Paris, France The Board of Trustees of The American College in Paris invites nominations and applications for the position of President, beginning 1 July 1988.

Pharmaceuticals Production China The pharmaceutical production facility of our joint venture in Tianjin, Peoples Republic of China, seeks a Technical Director for a 2-3 year assignment.

Subscription form for International Herald Tribune with fields for name, address, phone, and subscription options.

KLA advertisement with bar chart showing sales from 1983 to 1986 and contact information for KLA Corporation.

PROJECT MANAGER-EGYPT advertisement for a construction project in Egypt, requiring a candidate with experience in the Mediterranean coast.

EXECUTIVES FOR INTERNATIONAL PORTFOLIO MANAGEMENT / SECURITIES TRADING / SALES advertisement for a London subsidiary of a highly successful and profitable Japanese International Securities House.

U.S. Futures Via The Associated Press

Table of U.S. Futures including Grains (Wheat, Corn, Soybeans), Food (Coffee, Sugar), and Livestock (Cattle, Hogs).

Currency Options

Table of Currency Options for Philadelphia Exchange, covering various currencies like the British Pound and Swiss Franc.

Paris Commodities

Table of Paris Commodities including Sugar, Cocoa, and Coffee.

London Commodities

Table of London Commodities including Sugar, Cocoa, and Coffee.

London Metals

Table of London Metals including Aluminum and Copper.

MUNICIPAL BONDS (CBT)

Table of Municipal Bonds (CBT) with columns for High, Low, Open, High, Low, Close, Chg.

EURODOLLARS (IMM)

Table of Eurodollars (IMM) with columns for High, Low, Open, High, Low, Close, Chg.

BRITISH POUND (IMM)

Table of British Pound (IMM) with columns for High, Low, Open, High, Low, Close, Chg.

CANADIAN DOLLAR (IMM)

Table of Canadian Dollar (IMM) with columns for High, Low, Open, High, Low, Close, Chg.

EUROPEAN CURRENCY (IMM)

Table of European Currency (IMM) with columns for High, Low, Open, High, Low, Close, Chg.

GERMAN MARK (IMM)

Table of German Mark (IMM) with columns for High, Low, Open, High, Low, Close, Chg.

FRANCO SWISS (IMM)

Table of Franco Swiss (IMM) with columns for High, Low, Open, High, Low, Close, Chg.

SWISS FRANC (IMM)

Table of Swiss Franc (IMM) with columns for High, Low, Open, High, Low, Close, Chg.

FINANCIAL

Table of Financial indices including J.S. Mills (IMM) and US Treasury Bonds (CBT).

US TREASURY BONDS (CBT)

Table of US Treasury Bonds (CBT) with columns for High, Low, Open, High, Low, Close, Chg.

DM FUTURES OPTIONS

Table of DM Futures Options with columns for High, Low, Open, High, Low, Close, Chg.

U.S. TREASURIES

Table of U.S. Treasuries with columns for High, Low, Open, High, Low, Close, Chg.

INTERNATIONAL STOCK MARKETS

Table of International Stock Markets including London, Paris, and Tokyo.

WEDNESDAY'S AMEX CLOSING

Tables include the nationwide prices on the closing on Wall Street and do not reflect late trades elsewhere.

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Currency Advances

Text discussing currency advances, mentioning the dollar and various international markets.

WEDNESDAY'S OTC PRICES

Table of Wednesday's OTC Prices for various stocks and commodities.

WORLD STOCKS IN REVIEW

Table of World Stocks in Review, including London, Paris, and Tokyo markets.

Additional text and advertisements at the bottom right of the page.

CURRENCY MARKETS

Dollar Advances on Short-Covering

LONDON — The dollar revived Wednesday in late trading, buoyed by nervous short-covering ahead of Friday's U.S. trade figures for July. Currency rates already reflect expectations of a trade deficit of around \$16 billion, dealers said.

London Dollar Rates table with columns for Currency, Bid, and Offer rates.

coordinated dollar support by European monetary authorities. In London, the dollar closed higher at 1.7960 Deutsche marks, after 1.7920 on Tuesday, and only slightly lower at 141.55 yen from 141.65.

Sumita Says Central Banks Backed Currency Cooperation

TOKYO — Central bank governors reaffirmed their determination to cooperate to stabilize exchange rates when they met in Basel earlier this week, the Bank of Japan governor, Satoshi Sumita, said Wednesday.

Officials from West Germany and Japan have recently confirmed that agreements on approximate dollar trading ranges emerged from discussions earlier this year on currency stability. These talks were highlighted by the so-called Louve accord reached in February by six major industrialized countries.

GATT: As U.S. Fights to Revive the Free Trade Code, Many Say Reality Has Killed It

took two years to get a GATT panel ruling, which indeed found in favor of the Americans. The community, exercising its veto rights under the GATT system, then blocked adoption of the panel report, and spent the next four years in on-and-off negotiations with the United States that also involved a separate dispute over citrus products.

De Clercq Likens Disputes To Protectionism of 1930s

MOUNT FUJI, Japan — Current protectionist pressures are potentially as dangerous as a wave of restrictive trade laws that contributed to the start of World War II, the European Community's external affairs commissioner said Wednesday.



Willy De Clercq

Mr. De Clercq said that the protectionist mood in the U.S. Congress could trigger disaster. "It is in the camp of trigger-happy protectionists success in passing through the draconian measures they are clamoring for, then quite obviously such measures would fall most heavily on Japan," he said.

a member country should treat its trading partners in a non-discriminatory fashion, a concept known as Most Favored Nation. But that does not rule out trade restrictions. "Korea may be restrictive toward Canada," he noted, "but it can comply with MFN rules by treating the United States the same way. In other words, under GATT, a restrictive country can be restrictive to everybody."

One of the most pervasive problems in GATT is its inability to deal with the agricultural subsidies that have come to dominate world trade. Cases involving such subsidies have been the source of bitter fights between the United States and the European Community, dramatizing both the flaws in the procedures for settling disputes and some very fundamental differences in the way these two major trading partners view GATT's role of GATT.

The reform panel, in what was apparently an unconscious, but wickily apt, parody of the GATT bureaucracy, is officially known as FOGS, for Functioning of the GATT System.

ing wisdom that the agreement, even in its heyday, ever really approached the overhauled, free-market trading order its founders take credit for having established.

et Union's bid to join has been blocked by the United States on the ground that the Soviet trading system is incompatible with GATT.

In the latest twist, however, the U.S. State Department is pushing Moscow's application to join a textile agreement administered by GATT in hopes of creating a better atmosphere for arms talks later this year.

"GATT is not a court of law, it is 94 countries with sovereignty," said Sir Roy Denman, a veteran trade negotiator who heads the Washington delegation of the European Commission, the EC's executive body.

Wednesday's OTC Prices NASDAQ prices as of 3 p.m. New York time. Via The Associated Press.

Table A: OTC prices for various stocks including ADC, ABC, and others.

Table B: OTC prices for various stocks including BDC, BDE, and others.

Table C: OTC prices for various stocks including CDC, CDE, and others.

Table D: OTC prices for various stocks including DDC, DDE, and others.

Table E: OTC prices for various stocks including EDC, EDE, and others.

Table F: OTC prices for various stocks including FDC, FDE, and others.

Table G: OTC prices for various stocks including GDC, GDE, and others.

Table H: OTC prices for various stocks including HDC, HDE, and others.

Table I: OTC prices for various stocks including IDC, IDE, and others.

Table J: OTC prices for various stocks including JDC, JDE, and others.

Table K: OTC prices for various stocks including KDC, KDE, and others.

Table L: OTC prices for various stocks including LDC, LDE, and others.

Table M: OTC prices for various stocks including MDC, MDE, and others.

Table N: OTC prices for various stocks including NDC, NDE, and others.

Table O: OTC prices for various stocks including ODC, ODE, and others.

Table P: OTC prices for various stocks including PDC, PDE, and others.

Table Q: OTC prices for various stocks including QDC, QDE, and others.

Table R: OTC prices for various stocks including RDC, RDE, and others.

Table S: OTC prices for various stocks including SDC, SDE, and others.

Table T: OTC prices for various stocks including TDC, TDE, and others.

Table U: OTC prices for various stocks including UDC, UDE, and others.

Wednesday's AMEX Closing. Tables include the nationwide prices up to the closing on Wall Street and do not reflect trades elsewhere.

Table V: OTC prices for various stocks including VDC, VDE, and others.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61

ACROSS 1 Subsidies 5 Goals' offsping 12 Ivy League school 13 Fattened rooster 14 Hardy's "the Obscure" 15 Essayist 16 Carrot's cousin 17 Author 18 First word of Goldberg quote 20 Door sign 21 "Henry VI" character 22 Jug's kin 23 Quote: Part II image 32 Menacing March day 33 Magician's item 34 Takes to court 35 Called by loudspeaker 37 Corn dish 38 Chemical suffix 39 Luxurious 40 Subordinate

41 Quote: Part III 45 Hill dweller 46 Abate 47 Lax 50 Quote: Part IV 55 Actor Douglas 56 Beat 57 Atop 58 Loans 59 A lunchtime Williams 61 End of quote 62 Confederate 63 Descry

20 Time periods 22 Like some cars 23 "A Doll's House" playwright 24 Spa feature 25 Kiltner poem 26 "The Iguana" Williams 27 Presidential initials 28 Whiplash 29 Asian city 30 Forever, in poesy 35 Byron, e.g. Buridan's vacillator 37 Forest dropper 39 Panther color? 40 Skirt style 42 Not neat or stylish 43 Jackson bill 44 Clock parts 47 Twist 48 Tall-growing bean 49 Troops 50 Labor 51 Ship's frame 52 A son of Seth 53 "Bus" Inge play 54 Actor Curtis 56 School org.

PEANUTS HEY, CHUCK. MARGIE SAYS SHE CALLED YOU TO SEE WHO YOU LIKE BEST, HER OR ME... HOW ABOUT IT, CHUCK? WANT TO THINK ABOUT IT FOR A MINUTE? HER OR ME, CHUCK? ME OR HER? HOW ABOUT IT, CHUCK? WE'RE SORRY, THE NUMBER YOU HAVE REACHED IS NOT IN ORDER... AND PROBABLY NEVER WILL BE IN ORDER AGAIN...

BLONDIE THERE'S NO WAY YOU CAN REUSE THIS PRODUCT! NO WAY! ABSOLUTELY NO WAY!! I ALREADY OWN ONE AND I HATE IT! HOW COME THERE'S ALWAYS A WAY?

BEETLE BAILEY LET'S TREAT OURSELVES TO A REAL MEAL. YEAH, I'M SICK OF ARMY CHOW. HOP ALONG! THE HAG LOOKS GOOD. GOT ANY CREAMED CHIP BEEF ON TOAST?

ANDY CAPP WONDERS WILL NEVER RISE AND DIE WITH CREAM ON MY FACE. ANYTHING FOR A QUIET LIFE?

WIZARD OF ID UMBRELLA SHOP WE HAVE FIVE, TEN OR TWENTY DOLLARS. HOW BIG IS THE FIVE DOLLAR UMBRELLA? UMBRELLA IT COMES IN A SINGAPORE SLANG!

REX MORGAN I'D BE HAPPY TO CALL YOU GINDI EXCEPT IN CLASS, MS. KANE? COME UP TO DR. MORGAN'S OFFICE WITH ME! IT'LL BE MORE COMFORTABLE WAITING HERE IN THE CAR! I HOPE THAT THE DOCTOR DOESN'T FIND ANYTHING SERIOUSLY WRONG, PROFESSOR? HELL, I'M SURE THAT I'M FIT AND STRONG AS A HORSE, GINDI!

GARFIELD P-THB-THB-THB-THB!

BOOKS MICHAEL: A Novel By Joseph Goebbels. Translated from the German by Joachim Neugroschel. 131 pages. Paperback. \$6.95. Amok Press, P.O. Box 51, Cooper Station, New York, N.Y. 10276. Reviewed by John Gross

BRIDGE By Alan Truscott on the diagrammed deal against some novices. The opening spade lead was with

WORLD STOCK MARKETS Via Agence France Presse Closing prices in local currencies, Sept. 9.

McNeil Ousts... Edberg... Kozlov... Kozlov... Kozlov...

KOREBOARD Transition... Football... Basketball...

Canada... Montreal... Toronto... Vancouver...

SPORTS

McNeil Ousts Evert; Graf and Edberg Win

NEW YORK — Chris Evert was ousted by Lori McNeil in the quarterfinals of the U.S. Open tennis championships Wednesday...

McNeil, 24, "I kept coming in — and it worked." Meanwhile, top-seeded Steffi Graf of West Germany defeated No. 3 Ivan Lendl...

Edberg beat fellow Swede Jonas Svensson, 6-2, 7-6 (10-8), 6-3, and Wilander beat American Ken Flach, 6-3, 6-3, 7-6 (7-4).

Yakovlev, who lost in last year's final to Navratilova, was anxious to get in her match with Kohde-Kilsch...

A Prodigy May Face Some Basic Training

By Peter Alfano New York Times Service

NEW YORK — This has been a disappointing year for Boris Becker, the West German tennis prodigy...

But in some ways Becker's Wimbledon success slowed down the overall development of his game.



Becker: The power game isn't enough.

with his boyhood coach, Günther Bosch, and began asserting himself more.

Those qualities helped Becker win Wimbledon and handle the enormous pressure of being a national hero...

Although Becker grew up on clay, his style is more suited to faster surfaces. Still, the grass at Wimbledon is the only place where a serve-and-volleyer can win without some semblance of a backcourt game.

NFL Players Set Strike Deadline

By Irvin Molinsky New York Times Service WASHINGTON — The National Football League players' association voted late Tuesday to go on strike after the second day of the season if a contract were not agreed to by then.

Gene Upshaw: "No choice." what their strike agenda is, what is their bargaining agenda? But Donlan did not rule out the possibility of reaching an agreement without a strike...

line extension if the players and owners make some progress toward an agreement. "Jack and I have to work against the deadline," he said.

Expos, 3 Games From Top, Play Their Cards Right

Compiled by Our Staff From Dispatches

MONTEAL — Playing the top team in their division has brought out the best in the Montreal Expos. Behind the four-hit pitching of...

Royals 4, Angels 2: In the American League, in Anaheim, California, Mark Gubicza ended a personal six-game losing streak...

set by J.C. Martin of the Chicago White Sox in 1965. "I'd say I've got a good chance to break it," said Petrali.

SCOREBOARD

Transition

Table with columns for Transition, Football, Tennis, and Baseball. Includes sub-sections for CFL Leaders, U.S. Open Results, European Soccer, PGA Leaders, and Hockey.

Football

Table with columns for Football, Tennis, and Baseball. Includes sub-sections for CFL Leaders, U.S. Open Results, European Soccer, PGA Leaders, and Hockey.

Tennis

Table with columns for Tennis, Baseball, and Hockey. Includes sub-sections for U.S. Open Results, European Soccer, PGA Leaders, and Hockey.

Baseball

Table with columns for Baseball, Hockey, and Golf. Includes sub-sections for Tuesday's Line Scores, European Soccer, PGA Leaders, and Hockey.

Anthem Singer Ends an Odyssey

Washington Post Service

BALTIMORE — Most men lead lives of quiet desperation. Jeff Wickstrom sings the national anthem at the top of his lungs from coast to coast at his own expense.

kept in good shape that I'll probably sell when I get back home. "I didn't make one cent. And I haven't gotten any singing offers."

One night, he sang for the Mariners at 7:30, drove across town for the second act of "Toots," ran next door to do the anthem for a hockey game, then finished "Toots" — all the time wearing the tricorn hat and brass sword of an early 19th century Roman policeman.

Transition

Football

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Tennis

Baseball

Table with columns for Tennis, Baseball, and Hockey.

Baseball

Hockey

Table with columns for Baseball, Hockey, and Golf.

Hockey

Golf

Table with columns for Hockey, Golf, and Baseball.

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Advertisement for International Classified, featuring various escort services and agencies like ESCORTS & GUIDES, INTERNATIONAL ESCORT, and MAJORITY CREDIT CARDS.

ART BUCHWALD The \$75,000 Diploma

WASHINGTON — Word from the old alma mater is that the price of private education is going up faster than the U.S. national debt. A recent College Board survey revealed that the price of a diploma at one of the more expensive schools is now \$75,000, or ski trips during the school break.

father gave the young man his cuff links, the clasp and gold watch. "This is it," the father told the boy. "When they are gone you're on your own."

One student at Georgetown University took the news calmly. "No body wants to force our parents to come up with 75 big ones, but if that's the price we young Americans have to pay for a good education, I say it's money well spent."

"I don't think that's a lot of money to pay for a semester. After all, we have given up a great deal to play football for our school."

Malle Film Wins in Venice

VENICE — The French film "Au Revoir, les Enfants," directed by Louis Malle, won the Golden Lion first prize Wednesday at the 44th Venice International Film Festival.

Latest in Leisure Gear: Submarines

By Kurt Eichenwald New York Times Service

NEW YORK — Looking for a used submarine? So are hundreds of other people. Seaforth Holdings Ltd. found that when it took out an advertisement in May in The New York Times, with the headline, "Submarine for sale," the British ship-repair company wanted to sell two attack submarines that it had bought from the Royal Navy.



This retired underwater vessel, moored in the Seine near Paris, now serves as a nightclub.

"From the response, it would appear that there is quite a large market for leisure submarines," said Peter J. Dunn, the marketing and design director at Seaforth, which is based in Liverpool, England.

The industry's recent success in the tourist market was spawned, in part, by a past failure in the business market. The smaller submarines were frequently used during the 1970s and early 1980s for deep-sea exploration by the oil companies. But the sharp fall in oil prices eliminated the demand for many submarines, so the technicians and engineers who operated the vessels began searching for new uses.

The military market appears to remain inactive, although few in the industry are willing to provide details. The smaller companies often deal with countries that are unable to build their own submarines, such as Thailand and Malaysia, industry officials said.

Some of the companies have also been approached by private arms dealers, but many industry officials said they avoid the dealers out of fear of not getting paid.

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PEOPLE Music World Stars Aid Ailing Woody Herman

Big band leader Woody Herman, bedridden and broke, has been saved from eviction from his home of more than 40 years by the promise of help from the music world. Celebrities came together to save Herman from being evicted from the house he lost to an Internal Revenue Service auction sale, and the new owner agreed to let the 74-year-old bandleader and his daughter remain until at least the end of 1988.

Hundreds of screaming Japanese fans greeted singer Michael Jackson waving ginger hands Wednesday as the exclusive superstar arrived to launch a worldwide concert tour, his first in four years.

A children's choir sang a welcome to the Prince and Princess of Wales as they arrived Wednesday in Caen to begin this year's tour of the French coast.

U.S. Plans Jay New Aid to Contras

WASHINGTON — Secretary of State George P. Shultz said Thursday that the U.S. will provide \$12.4 billion in new aid to the Contras in Nicaragua.

Shultz said the aid request would be made until after the contra's \$100 million in U.S. and other funds are spent.

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Vertical sidebar containing various small advertisements and notices, including 'The Global Newspaper', 'Kiosk', and 'Pages 6 & 23 FOR MORE CLASSIFIEDS'.